90

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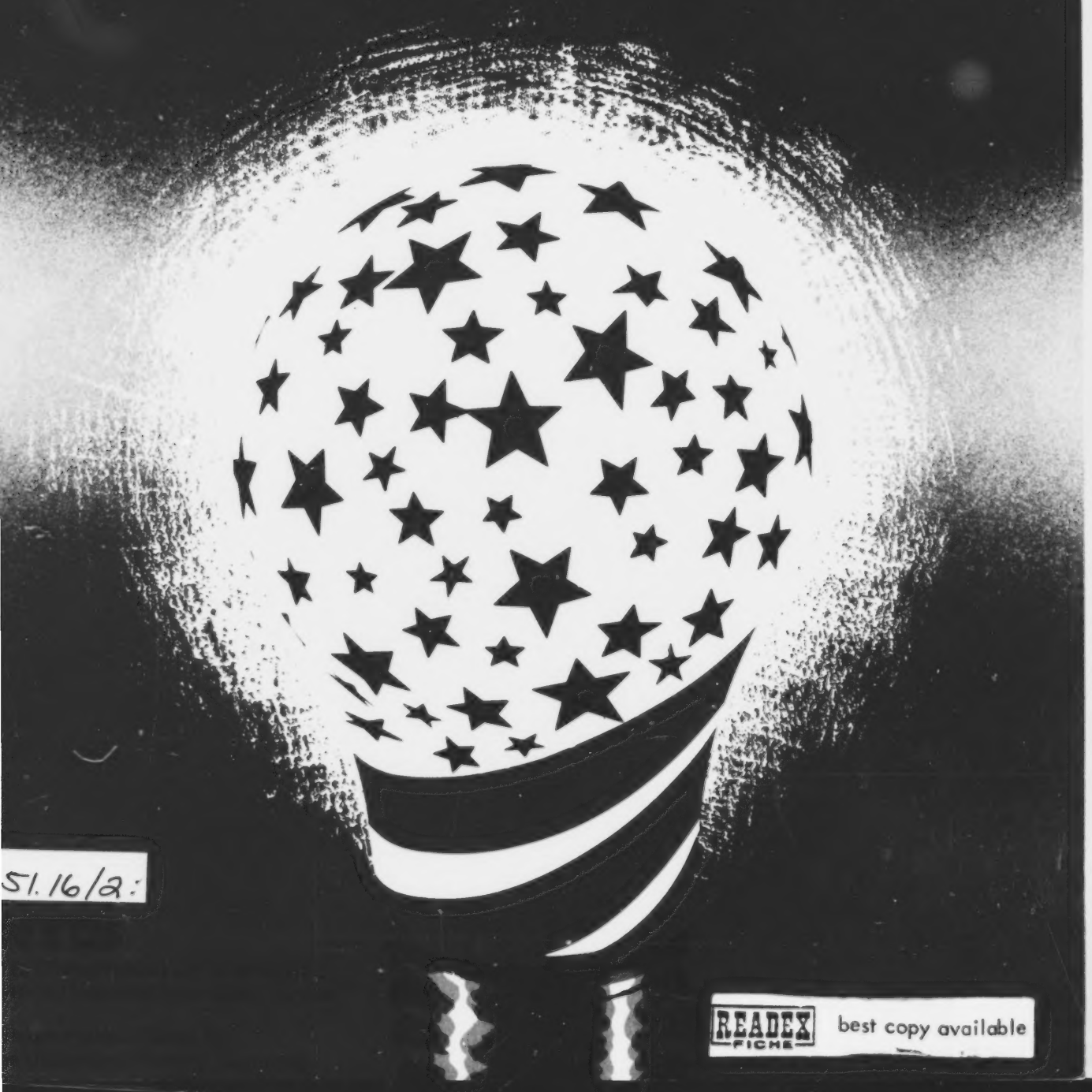

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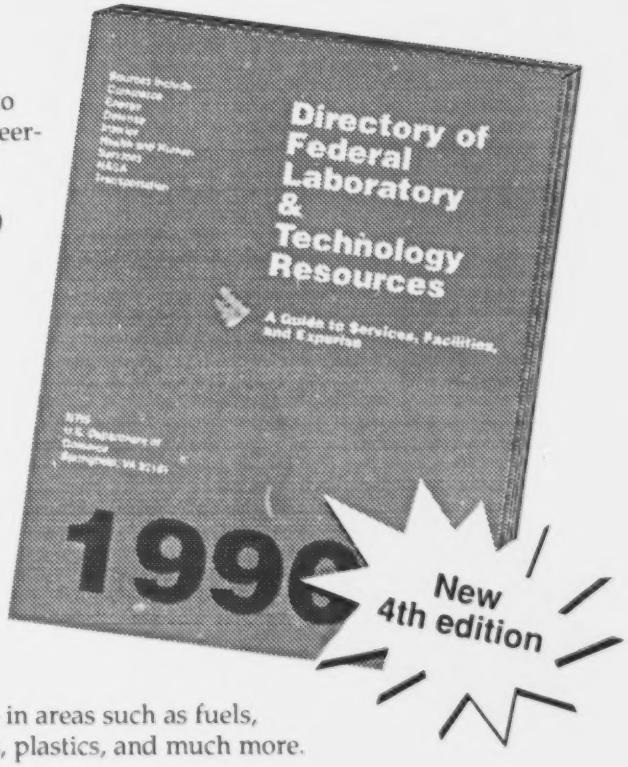
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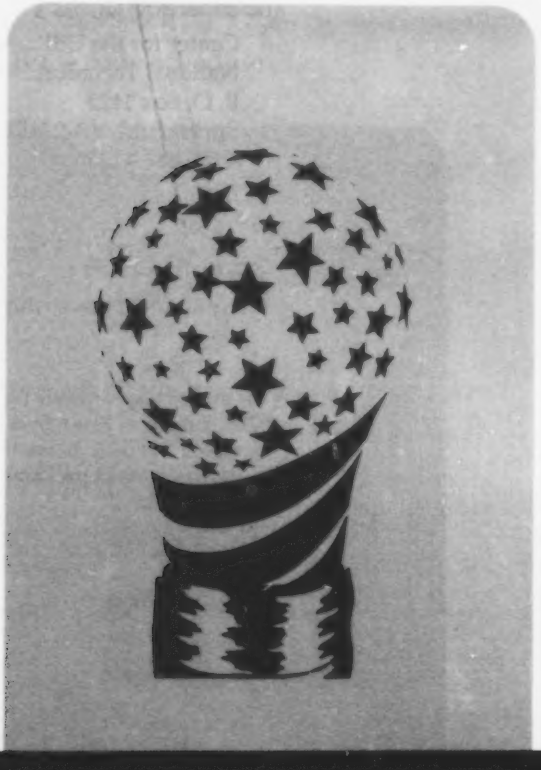

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Catalog of Government Inventions Available for Licensing–1990

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Mr. Robert Kempf (202) 453-2424

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Washington, DC 20324
Mr. Donald J. Singer (202) 475-1386

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- The number of people employed by the applicant in whatever capacity;
- Identity of parent companies or organizations of which the applicant is a subsidiary;
- A detailed description of the applicant's plan for development and marketing the invention, including estimates of the amount of capital, equipment, and personnel which the applicant believes are necessary over time for specific phases of development to commercialize the invention;

- A detailed statement of the applicant's capabilities and intentions to implement the development and marketing plan, including information regarding manufacturing, marketing, financial, and technical resources;
- A prioritized indication of the fields or modes of use for which the applicant intends to use the subject invention;
- A statement of the geographic areas in which the applicant intends to manufacture products embodying the invention and in which the applicant intends to use and/or sell the invention;
- Identification of licenses previously issued to the applicant under Federally owned inventions;
- A statement of the applicant's best knowledge of the extent to which the invention is being practiced experimentally and/or commercially; and
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Human factors
Instruments & equipment
Pharmacology
Other

Mining

Navigation & guidance

Photography & recording devices

Physics
Image processing
Optics
Other

Transportation
Aircraft
Other

Sample Entries

Catalog reference number

Government agency filing application

Application page count

Patent application number. Use in ordering copy

0056 Integral/Low Voltage Control for Miniature Impact Tool
Phillips, Raymond J.
Department of the Navy, Washington, DC.
Filed 11 May 81 8p
PAT-APPL-6-262-581 Available from NTIS: Price code A02

Price of patent application. See NTIS Patent Application Order form at end of catalog

The patent application describes a miniature impact tool that has an electrical switch mounted on the tool for ease of operation. The switch is connected to a bench mounted speed control unit that has a built-in relay and transformer for safety. The line that is operated by the switch is on the low voltage side of the transformer to reduce any chance of electrical shock. The speed control unit is electrically connected to a drive motor. The drive motor has a flexible drive shaft connected to the tool for mechanically driving the tool.

Summary of invention

1129 Vehicle Suspension Using Pressurized Bourdon Tubes
Petrick, Ernest N.
Department of the Army, Washington, DC.
Filed 10 Dec 79 patented 10 Mar 81 6p
PATENT-4,254,970 Available from Comm. of Patents

Patent number. Use when ordering patents from Commissioner of Patents

Government agency receiving patent

Pages in patent

The patent describes a vehicle suspension especially for tracked vehicles, comprising an internally pressurized Bourdon tube operatively located between the sprung mass and each road wheel. A single liquid pump can be used to selectively pressurize difference ones of the Bourdon tubes to different pressure values in accordance with expected loadings for particular ones of the road wheels. Depressurization of all Bourdon tubes can be used for vehicle height control, as for example to reduce the silhouette of a military vehicle and/or reduce ground clearance.

Invention summary

Cross Reference

A Thermal Energy Transformer
See 0076

Summary catalog number

Catalog subject category where the full summary appears

INVENTION SUMMARIES

AGRICULTURE & FOOD

Adventitious Citrus Juice Vesicles from Pre-Existing Juice Vesicles
See 0687

0001 Agricultural Commodity Condition Measurement
H. A. Affeldt, J. A. Abbott
Agricultural Research Service, Washington, DC
Filed 13 Oct 89 40p
PAT-APPL-7-421 028 Available from NTIS: price code N03
The invention relates to determination of the condition of an agricultural commodity (AC) e.g. fruits and vegetables, by inputting band-limited vibrations, sensing vibrational characteristics of the commodity resulting from the input vibrations, and analysis of the vibrational characteristics.

0002 Apparatus for Cleaning Cotton
R. V. Baker
Agricultural Research Service, Washington, DC
Filed 13 Dec 89 25p
PAT-APPL-7-450 109 Available from NTIS: price code N03
The invention relates to cleaning cotton, in particular to removing cotton burs, plant sticks and stems, and finely divided foreign matter from seed cotton.

0003 Automated Excision of Undesirable Material and Production of Starting Material for Restructured Meat
W. Heiland, R. P. Konstance, J. C. Craig
Agricultural Research Service, Washington, DC
15 Aug 90 42p
PAT-APPL-7-567 832 Available from NTIS: price code N03
The invention relates to processes and apparatuses for automated excision of undesirable material and automated production of starting material for restructured meat (e.g. beef, such as steaks or roasts, beef chuck, lamb, chicken, pork, etc.) products.

0004 Biocontrol of Grey-Mold in Pome Fruits Using 'Acremonium breve'
W. J. Janisiewicz
Agricultural Research Service, Washington, DC
Filed 24 Feb 88 16p
PAT-APPL-7-159 915 Available from NTIS: price code A03
The invention relates to the biological control of postharvest diseases in fruits. More particularly, the invention relates to the use of Acremonuim breve, to biologically control the postharvest disease, grey-mold, in pome fruits.

Biocontrol of Grey-Mold in Pome Fruits Using 'Acremonium breve'
See 0696

0005 Biocontrol of Postharvest Rots in Fruit
R. G. Roberts
Agricultural Research Service, Washington, DC
Filed 30 Mar 90 34p
PAT-APPL-7-501 913 Available from NTIS: price code A03
The invention relates to the biological control of postharvest diseases in agricultural commodities. More particularly, the invention relates to the use of selected strains of microorganisms to biologically control postharvest diseases including mucor rot, gray mold, and blue mold in fruit.

0006 Biological Control of Fruit Rot
P. L. Pusey, C. L. Wilson
Department of Agriculture, Washington, DC
Filed 11 Aug 89 8p
PAT-APPL-7-393 010 Available from NTIS: price code N03
It now has been discovered that a strain of B. subtilis bacteria effectively inhibits the growth of brown rot (Monilinia fructicola) on peaches when applied to preharvest peaches, effectively inhibits the growth of brown rot, gray mold rot (Botrytis cinerea) and bitter rot (Glomerella cingulata) on apples when applied to post harvest apples, and effectively inhibits the growth of gray mold rot on grapes when applied to post harvest grapes.

0007 Biological Control of Postharvest Rots in Fruits Using Pichia Guilliermondii (anamorph 'Candida guilliermondii')
C. Wilson, E. Chalutz
Agricultural Research Service, Washington, DC
Filed 30 May 90 29p
PAT-APPL-7-530 381 Available from NTIS: price code N03
The invention relates to the biological control of postharvest diseases in fruit. More particularly, the invention relates to a method for biologically controlling postharvest rots on fruits using strains of Pichia guilliermondii

0008 Coatings for Substrates Including High Moisture Edible Substrates
J. M. Krochta
Agricultural Research Service, Washington, DC
Filed 13 Dec 89 26p
PAT-APPL-7-450 192 Available from NTIS: price code N03
The invention relates to protective coatings for substrates, including high moisture edible substrates. More particularly, the invention relates to coating compositions, and to a novel method of forming a protective coating on substrates from emulsions and suspensions of proteins and hydrophobic materials.

Device for Regulating Luminous Flux of Battery Powered Headlamp
See 0316

0009 Double Antibody ELISA for HEV Antigen and Antibody
K. Nazerian, L. F. Lee
Agricultural Research Service, Washington, DC
Filed 3 May 90 21p
PAT-APPL-7-519 514 Available from NTIS: price code N03
The objects of the invention are: to provide a more sensitive and specific assay for HEV antibody and antigen than the previously described single-antibody ELISA; to provide a facile and effective means for determining titers of maternal antibody to HEV in turkey poults and the appropriate time for vaccinating a flock against HEV; to provide an effective means for diagnosing turkeys for HEV infection and for detecting HEV antigen in infected tissue or cell culture without the need for extensive purification of the antigen; and to provide a double antibody ELISA kit for detecting antibody to HEV and also a double antibody ELISA kit for detecting HEV antigen.

0010 Enhancement of Nitrogen Fixation with Bradyrhizobium japonicum Mutants
L. D. Kuykendall, W. J. Hunter
Agricultural Research Service, Washington, DC
Filed 17 Mar 89 18p
PAT-APPL-7-325 184 Available from NTIS: price code A03
The objects of the invention are: to provide improved bacterial strains for inoculating leguminous crops to increase symbiotic fixation of atmospheric nitrogen; to enhance the potential of soybeans and other leguminous plants for symbiotic fixation of atmospheric nitrogen.

0011 Estimation of Fumigant Residues in Commodities
C. R. Sell, M. A. Weiss
Department of Agriculture, Washington, DC
Filed 29 Dec 89 29p
PAT-APPL-7-459 405 Available from NTIS: price code N03
The invention relates to a method and apparatus for accurately estimating the concentration of residual fumigant in a commodity in a fumigation chamber from the decline in concentration of fumigant in the exhaust air stream during the aeration period following fumigation.

0012 Flan-Type Pudding
R. S. Kadan, G. M. Ziegler
Department of Agriculture, Washington, DC
Filed 30 Jan 89, patented 24 Apr 90 1p
PATENT-4 919 958 Available from Comm. of Patents
The invention is drawn to improvements in egg-free compositions for flan-type puddings which provide pudding properties more closely resembling the properties of egg flan. The improved egg-free compositions of the present invention comprise: milk, sweetener, rice flour, carrageenan, tetra potassium pyrophosphate, pectin, locust bean gum and at least one material selected from the group consisting of cheese whey protein isolate and xanthane gum.

0013 Fruit Decelerator
D. L. Peterson
Agricultural Research Service, Washington, DC
Filed 1 Jun 90 13p
PAT-APPL-7-531 680 Available from NTIS: price code N03
The invention relates to the handling of fruit during harvesting or transferring thereof. Broadly, the apparatus comprises a resilient catching surface immediately above the conveyor, that is able to intercept free-falling fruit at speeds equal to a velocity as high as several feet of free-fall without harming the fruit; a plurality of side-by-side parallel channels extending downward from the catching surface toward the conveyor through which individual fruits pass directly to the conveyor; wherein each channel is defined by opposed, resilient walls; wherein each of the walls includes means to propel fruit through a channel at a velocity lower than the impact velocity on the catching surface; wherein the catching surface includes means to direct or propel fruit to the channels.

0014 Inhibiting Plant Pathogens with an Antagonistic Microorganism(s)
R. J. McLaughlin, C. L. Wilson, E. Chalutz
Agricultural Research Service, Washington, DC
Filed 18 Aug 89 62p
PAT-APPL-7-395 681 Available from NTIS: price code N03
The present invention relates to the biological control of plant diseases (e.g. either pre-harvest or postharvest diseases) in agricultural commodities such as fruit. The first aspect of the invention relates to processes for inhibiting plant pathogen development on an agricultural commodity. The second aspect of the invention relates to processes for inhibiting plant pathogen development on an agricultural commodity. The third aspect of the invention pertains to compositions which may be utilized in carrying out the aforementioned processes. The fourth aspect of the invention relates to manufactures. The fifth aspect of the invention relates to a biologically pure culture of an isolate of Hanseniaspora uvarum having the identifying characteristics of isolate NRRL Y-18527.

0015 Inhibiting Plant Pathogens with Nonantibiotic Antagonistic Microorganism(s)
C. L. Wilson
Agricultural Research Service, Washington, DC
Filed 31 Jul 89 49p
PAT-APPL-7-387 669 Available from NTIS: price code N03
The first aspect of the invention relates to a process for inhibiting plant pathogen development on an agricultural commodity. The second aspect of the invention pertains to compositions which may be utilized in carrying out the aforementioned process. Such compositions include: A composition comprising a mixture of, (1) at least one microorganism which is an antagonist against plant pathogens but is not antibiotic and, (2) a carrier for said at least one microorganism selected from the group consisting of a gel, oil, wax, starch, talc, and mixtures thereof; and/or A composition comprising a mixture of, microorganisms and a carrier for said microorganisms, wherein at least 99% by volume of said microorganisms are antagonistic against plant pathogens but are not antibiotic. The third aspect of the present invention relates to manufacture.

0016 Insect Detection Using a Pitfall Probe Trap Having Vibration Detection

Agricultural Research Service, Washington, DC
Filed 18 May 90 37p
PAT-APPL-7-525 016 Available from NTIS: price code N03
Pitfall probe traps are commonly used in the grain industry to detect insect infestations. Objects and advantages of the invention are: to provide novel, advantageous and highly unobvious detection of insect infestation in an agricultural commodity; to accomplish the foregoing in a quick, inexpensive, reliable and accurate manner; to provide detection for an extended period of time without the necessity for removing the insect pitfall probe trap from the agricultural commodity thereby saving substantial time and effort; to provide continuous insect surveillance even in very large facilities; to accomplish the foregoing in a manner which does not require trained personnel, elaborate testing facilities, or extensive acoustical detection elements.

0017 Lactose Hydrolysis by Mutant 'Streptococcus thermophilus'
G. A. Somkuti
Agricultural Research Service, Washington, DC
Filed 23 Apr 90 18p
PAT-APPL-7-513 480 Available from NTIS: price code A03
The relatively high thermostability of S. thermophilus makes the organism ideally suited for industrial applications. Objects of the invention are: to provide mutant strains of S. thermophilus having a defective lactose transport system;

to provide methods for the efficient and economical production of reduced or lactose free dairy foods using these strains. When cells of the mutant strains are 'decryptified', that is treated with solvent or detergent compositions, the resulting product act as 'microcarriers' for thermostable beta-galactosidase. These microcarriers can be stored for long periods without loss of enzyme activity. Addition of the microcarriers to lactose containing media results in hydrolysis without concomitant fermentation and the unwanted build up of lactic acid. Thermostability of the enzyme makes the product especially suited for industrial fermentation processes.

0018 Method for Classifying Wheat Kernels as Hard or Soft

G. M. Glenn
Agricultural Research Service, Washington, DC
Filed 12 Jun 90 13p
PAT-APPL-7-536 865 Available from NTIS: price code N03

The method of the invention provides an accurate, objective method for classifying single kernels of wheat as hard or soft. In the method of the invention, a raw wheat kernel having at least one substantially flat, planar face is cut at a predetermined thickness at which essentially all hard wheat varieties remain intact and essentially all soft wheat varieties do not remain intact. The method of the invention is useful for screening commercial lots of wheat to identify those lots where hard and soft wheat varieties have been intermixed. In this aspect, the invention provides a means for quality control of wheat samples. The invention is also useful to wheat breeders and researchers who need to accurately classify wheat samples. Because only a portion of each kernel is needed for testing, the invention finds particular use in those instances where only limited amounts of sample are available.

0019 Method for Producing 'Lilium elegans'

M. S. Roh
Agricultural Research Service, Washington, DC
Filed 28 Mar 90 24p
PAT-APPL-7-501 638 Available from NTIS: price code A03

The invention relates to products and methods for the production of lily plants specifically Lilium elegans Thunb., from bulbils produced in leaf axils and Lilium Longiflorum Thunb., lilies produced from seedlings or bulblets derived from tissue culture or leaf cuttings.

0020 Method for Removal of Gossypol from Cottonseed Meal by the Use of Urea in a Borate Containing Buffer

J. H. Schmidt, R. Wells, J. C. Bailey
Agricultural Research Service, Washington, DC
Filed 24 Aug 90 8p
PAT-APPL-7-572 070 Available from NTIS: price code N03

The objectives of the invention are: to provide a method for removing gossypol from plant material yielding a protein-rich product and/or oil relatively free from gossypol. In particular, it is an objective to provide a process for removing gossypol from plant meal, especially cottonseed meal; and to provide a gossypol-containing complex and a method of using the same as an insecticide.

0021 Methods for Inhibiting Rust Infections of Plants

R. E. Wilkinson, J. J. Roberts
Agricultural Research Service, Washington, DC
Filed 1 Aug 88 37p
PAT-APPL-7-226 608 Available from NTIS: price code A03

The invention is concerned with methods for treatment of fungal infections in plants, especially rust infections of wheat. The disadvantages and lack of success of these methods are apparent when one considers the huge economic losses which occur each year. The objects of the invention are: to provide methods and compounds for inhibiting or preventing rust infections; To provide methods and compounds which are safe, effective, and relatively inexpensive to use; To provide methods to reduce rust infection which can be used alone or in combination to increase effectiveness and decrease the probability of developing resistance to the compounds; and to provide methods and compounds which can be used topically, after infection occurs, to lessen reinfection.

0022 Microwave Technique for Single Kernel, Seed, Nut, or Fruit Moisture Content Determination

A. W. Kraszewski, S. O. Nelson
Agricultural Research Service, Washington, DC
Filed 1 Jun 90 13p
PAT-APPL-7-532 294 Available from NTIS: price code N03

A method for nondestructive determination of the moisture content of single articles such as single grain kernels, seeds, nuts, fruits, or other biological or agricultural products has been invented. According to the process, the sample article to be measured is inserted in a first position within a microwave resonant cavity coupled to a microwave radiation source and a measuring circuit. Subsequently, the energy dissipated in the sample article and the shift or change in the resonant frequency (or wavelength) due to the presence of the article in the cavity at the first position are measured. The orientation of the article in the cavity is then changed to a second position which is rotated by about n x 90 degrees with respect to the maximum electric field vector and the measurements are repeated. Averaged values of the energy dissipated in the article and the shift in the resonant frequency (or wavelength) measured in the previous steps are calculated. The moisture content of the article is determined from the ratio of these averaged values.

Molluscicidal beta-Carboline Carboxylic Acids and Methods Using the Same

See 0765

0023 Monoclonal Antibody Immunoassay Kit for Avian REV

L. F. Lee, Z. Cui, R. L. Witter
Agricultural Research Service, Washington, DC
Filed 12 Jun 90 16p
PAT-APPL-7-536 860 Available from NTIS: price code A03

The objects of the invention are: to use monoclonal antibody-mediated ELISA as a kit for diagnosis of REV infection in individual birds and for detecting REV antigen and antibody in poultry flocks; to use these two MAbs for capturing REV antigen; to provide REV-specific MAb useful in avian immunological research and pathological diagnosis; and to provide hybridoma cell lines for generating the subject MAbs.

0024 Nondestructive Measurement of Soluble Solids in Fruits Having a Rind or Skin
G. G. Dull, G. S. Birth, R. G. Leffler
Agricultural Research Service, Washington, DC
Filed 6 Aug 90 22p
PAT-APPL-7-563 170 Available from NTIS: price code N03
The present invention relates to use of near infrared (NIR) radiation for nondestructive measurement of soluble solids in fruits having a rind or skin. The invention is of particular benefit in that there is no current reliable nondestructive means to determine fruit quality, especially as it relates to soluble solids, including sugars. The purpose of the invention is to nondestructively determine soluble solids (e.g. as a measurement of sugar content) in a quick and efficient manner such that it can be used to grade fruit.

0025 Oat Soluble Dietary Fiber Compositions
G. E. Inglett
Department of Agriculture, Washington, DC
Filed 30 Jun 89 19p
PAT-APPL-7-373 978 Available from NTIS: price code N03
Water-soluble dietary fiber compositions can be prepared by treatment of oat-milled products with alpha-amylases. The dietary fiber compositions are colorless and devoid of inherent undesirable flavors and are, therefore, uniquely suitable for use in a variety of foods.

0026 Piezoelectric Apparatus and Process for Detection of Insect Infestation in an Agricultural Commodity
C. A. Litzkow, J. C. Webb, K. W. Vick
Department of Agriculture, Washington, DC
Filed 4 Apr 89, patented 26 Jun 90 2p
PATENT-4 937 555 Available from Comm. of Patents
The invention may be utilized to detect infestation by a variety of different insects such as rice weevil, lesser grain borer, angoumais moth, in numerous types of agricultural commodities including corn, wheat, rice nuts, cotton, etc. Various embodiments are disclosed including use of the piezoelectric means, on a probe, with a sample cup, in a device for telemetry, and with various container means for containing an agricultural commodity including e.g. a truck, ship, railroad car and storage bin such as a silo or grain elevator.

0027 Plant Transformation by Gene Transfer into Pollen
J. A. Saunders, B. F. Matthews
Agricultural Research Service, Washington, DC
Filed 1 Jun 90 31p
PAT-APPL-7-530 485 Available from NTIS: price code A03
Present-day gene transfer techniques allow the possibility for the development of more productive crop plants at a pace much faster than before. Gene transfer and selection of the best plants has been the objective of breeding programs for years. Powerful new techniques for gene transfer recently have been developed for moving single genes and whole blocks of genes from one plant to another and even for moving genes from non-plants into plants. These new techniques can help mankind preserve the genetic diversity of plants by actually creating greater diversity through gene recombination. The invention relates to a novel method for producing transformed germplasm which circumvents many of the limitations associated with the present-day technology in this field.

0028 Produce Bagging Machine
D. E. Marshall, G. K. Brown, R. J. Wolthuis, C. L. Burton
Agricultural Research Service, Washington, DC
Filed 20 Jun 90 21p
PAT-APPL-7-540 982 Available from NTIS: price code N03
The object of the patent application is to minimize the impact received by produce or other articles susceptible to damage as they are put into bags by minimizing the height the objects drop as they proceed from an accumulated position, such as a hopper or support, into the bag. The apparatus of the invention puts the bag over theproduce or articles accumulated in the hopper or support before it is tipped. With the bag in place, the support tips and the produce or articles settle down into the bag as the support reaches the bottom of its sequence. The device is especially suited for bagging fruits and vegetables, such as apples, onions, oranges, peaches, etc.

0029 Pseudorabies Diagnosis Probes
A. K. Cheung
Agricultural Research Service, Washington, DC
Filed 13 Jun 90 27p
PAT-APPL-7-537 855 Available from NTIS: price code N03
The objects of the invention are to provide a sensitive and convenient alternative to existing techniques for diagnosis of latent Pseudorabies virus (PRV); to identify logical candidate regions in the PRV genome for developing nucleic acid probes useful for discriminating latent PRV infection from productive infection; to provide nucleic acid probes and antigens useful in the clinical diagnosis of latent PRV infection; to enable monitoring the spread of PRV in herds of swine and other susceptible livestock animals; and to provide a diagnostic basis for designing an effective control program for PRV in agricultural environments.

0030 Revertant Serotype 1 Marek's Disease Vaccine
R. L. Witter
Department of Agriculture, Washington, DC
Filed 10 Jul 87, patented 23 Jan 90 7p
PATENT-4 895 717 Available from Comm. of Patents
The objects of the invention are: to provide a novel, highly protective, serotype 1 vaccine against Marek's Disease (MD) in chickens; to provide both monovalent and polyvalent vaccines against MD which are more efficacious than those presently in commercial use; to improve the viability and productivity of chickens, particularly broilers and layers, and to reduce economic losses in the poultry industry caused by MD; and to provide an MD vaccine which is characterized by a rapid rate of replication, and thereby enhanced protective efficacy and in vitro production efficiency.

0031 Stabilizing Unmilled Brown Rice by Ethanol Extraction
E. T. Champagne, R. J. Hron, G. Abraham
Agricultural Research Service, Washington, DC
Filed 26 Jul 90 44p
PAT-APPL-7-557 822 Available from NTIS: price code N03
The invention is drawn to a highly advantageous and unobvious process for stabilizing unmilled brown rice comprising, contacting unmilled brown rice with ethanol under conditions providing extraction of 15% or less of brown rice oil from the unmilled brown rice by said ethanol in order to produce stabilized unmilled brown rice and ethanol having rice extracts therein, without milling of the rice during the

contacting, and separating the stabilized unmilled brown rice from the ethanol having rice extracts therein.

0032 Starch Encapsulation of Biologically Active Agents by a Continuous Process
M. E. Carr, W. M. Doane, R. E. Wing, E. B. Bagley
Agricultural Research Service, Washington, DC
Filed 25 Jun 90 25p
PAT-APPL-7-542 566 Available from NTIS: price code N03
The invention relates to a continuous process for encapsulating agricultural chemicals, biopesticides, food constituents, medicaments, and other biologically active agents for controlling their release and protecting them from degradation due to environmental exposure and to the compositions prepared thereby.

0033 Supercritical Fluid Extraction Enhancer
M. L. Hopper, J. W. King
Agricultural Research Service, Washington, DC
Filed 12 Jun 90 27p
PAT-APPL-7-536 861 Available from NTIS: price code N03
Supercritical fluid extraction is a technique whereby organic compounds can be extracted from sample matrices utilizing a dense carbon dioxide gas. The objects of the invention are: to provide a method of preparing a sample for supercritical fluid extraction; to provide a method increasing the permeability of a sample and controlling moisture in a sample so as to enhance extraction thereof by supercritical fluid extraction; to provide an improved method of supercritical fluid extraction; to provide an improved method of supercritical carbon dioxide extraction; and to provide an improved method of extracting volatile components from samples containing fats and moisture by supercritical extraction.

System for Analyzing Cotton
See 0569

0034 System for Analyzing Entrained Solids Such as Cotton or Seed
S. A. Anthony, O. S. McCaskill
Agricultural Research Service, Washington, DC
Filed 25 Apr 90 32p
PAT-APPL-7-514 478 Available from NTIS: price code A03
The invention relates to analyzing flowable solids such as cotton passing through a gin. Generally, the invention comprises a duct having fluid-entrained solids (or particulates) passing therethrough; by-pass means connected to the duct to remove a fluid stream containing a small part of the solids in the duct; means to separate the stream into a solids fraction and a fluid stream that essentially is free of the solids; means to direct the essentially solids-free fluid stream back to the duct downstream from the by-pass means; means to analyze the solids fraction; and means to disperse solids, after analysis, into the fluid stream being directed back to the duct.

0035 System for Assessing Bee Temperament
H. G. Spangler, E. H. Erickson
Agricultural Research Service, Washington, DC
Filed 25 Apr 90 17p
PAT-APPL-7-514 479 Available from NTIS: price code N03
The objects of the invention are to quantify the level of hostility in bees based upon the number of times the bees strike a target (attempting to sting), while attacking it over a defined interval; to provide a sting detection system that enables a curator or other person to determine what action, if any should be taken against a hive, such as destroying or requeening it with a queen whose offspring will be more gentle; to determine if a colony is gentle, moderately defensive or highly defensive; and to make possible the elimination of dangerous feral colonies from areas frequented by persons or livestock.

0036 Use of Native 'Aspergillus flavus' Strains to Prevent Aflatoxin Contamination
P. J. Cotty
Agricultural Research Service, Washington, DC
Filed 29 Nov 89 31p
PAT-APPL-7-442 885 Available from NTIS: price code N03
Certain strains of A. flavus produce little or no aflatoxin and yet are highly aggressive. These strains are effective agents for the prevention of aflatoxin contamination in commodities. It has been found that aflatoxin production by A. flavus is not required for infection of host tissues; furthermore, the ability to produce aflatoxins does not increase virulence of A. flavus. Therefore, aggressive strains which produce no aflatoxins should be able to competitively exclude toxigenic strains. Isolated non-toxigenic strains of A. flavus which occur naturally in agricultural fields have been found effective in preventing aflatoxin contamination by toxigenic strains. The task was undertaken to isolate these, more aggressive strains of A. flavus, test their ability to produce aflatoxins and use the least toxigenic strains to exclude the toxigenic strains via an inoculation method.

0037 Whipped Topping Formulation
G. N. Bookwalter
Agricultural Research Service, Washington, DC
Filed 25 Jul 90 19p
PAT-APPL-7-542 565 Available from NTIS: price code N03
A method has been discovered of making whippable formulations from NFDM and an edible, vegetable oil. These formulations can be converted to stable foams having a volume of up to about eight times that of the starting emulsion. Moreover, they are low in cholesterol and saturated fat, and can be prepackaged as a frozen blend for subsequent use. The objects of the invention are: to introduce a novel low-cholesterol, low-fat whipped topping formulation prepared by a simple economical process; to provide a whipped topping formulation that can be frozen for later use as a convenience food; and to provide a whipped topping formulation suitable for use by the general population or by special groups with dietary restrictions as to the level of milk fat and/or cholesterol ingestion.

CHEMISTRY: Analytical Chemistry

Apparatus and Method for Characterizing the Transmission Efficiency of a Mass Spectrometer
See 0894

0038 Bidirectional Draining Pore-Fluid Vessel
J. Prizio
Department of the Interior, Washington, DC
Filed 6 Mar 90 7p
PAT-APPL-7-490 898 Available from NTIS: price code N03
The invention pertains to an apparatus for extracting pore fluids from porous solids to determine the suitability for a potential repository to store high-level radioactive wastes. Pore fluids are necessary for chemical analysis to help

characterize the local hydrologic system and to evaluate the potential interaction of pore gas and water with waste canisters. The principal utility of the bidirectionally draining pore-fluid extraction vessel is that it extracts pore fluids from porous solids through a combination of one-dimensional mechanical compression and inert gas injection.

0039 Continuum Source Atomic Absorption Spectrometry
J. M. Harnly, G. P. Moulton, T. C. O'Haver
Agricultural Research Service, Washington, DC
Filed 30 Oct 89 25p
PAT-APPL-7-428 529 Available from NTIS: price code N03
Trace metals are being determined at the ultra-trace level (part per billion concentration). Existing systems make accurate determinations at these levels laborious and predominantly single element processes, as typified by current commercially available atomic absorption spectroscopy (AAS) instruments. These instruments use a different light source (hollow cathode lamp (HCL)) for each element. The present invention relates to dispersed light spectroscopy, specifically continuum source atomic absorption spectroscopy, whereby a multielement atomic absorption spectrometer is created with state-of-the-art detection limits for trace metals at all wavelengths; eliminating the need for a mechanical wavelength modulation device, allowing longer monitoring of each wavelength position, providing a higher quantum efficiency, and allowing better signal-to-noise ratios for trace metals with analytical lines in the far ultraviolet region, by use of an IADM (integrating arroy detector means). The process comprises atomizing a sample to be analyzed; illuminating the atomized sample with a CLSM (continuous light source means) for emitting intensities from about 180 to about 800 nm, to produce a resultant light; directing the resultant light through a light dispersing means; detecting light simultaneously at more than one wavelength at a focal plane of the light dispersing means using an IADM.

0040 Detection of Oxygen in Thin Films
A. K. Green, R. H. Hammond
Department of the Navy, Washington, DC
Filed 29 Sep 86, patented 12 Jan 88 5p
PATENT-4 719 120 Available from Comm. of Patents
This invention pertains to the field of measurement and testing. More particularly, the invention pertains to measurement of the gas content of material. The subject invention involves the deposition, on a first thin film layer which requires deposition in the presence of a substance which would otherwise escape from the layer prior to analysis of the layer for the substance, of a second layer, which captures the substance for subsequent analysis in the second layer, and involves the deposition on the second layer of a third layer which seals the second layer of a third layer which seals the second layer against entry of the substance from the environment. It is an object of the present invention to provide a method for the determination of the presence of such a substance in the first layer during deposition of the substance in a substrate. Another object is to provide a method using relatively simple and conventional apparatus in analysis for such a substance in a different vacuum chamber than that in which the first layer was deposited and after transfer of the films and substrate through the usual ambient terrestrial environment. A further object is to provide such a method particularly useful for determining the presence of oxygen within a growing Niobium Germanium film during vacuum deposition thereof at a relatively high temperature. Patents.

0041 Flow Immunosensor Method and Apparatus
F. S. Ligler, B. P. Gaber, A. W. Kusterbeck, G. A. Wemhoff
Department of the Navy, Washington, DC
Filed 23 Feb 90 35p
PAT-APPL-7-486 024 Available from NTIS: price code N03
This invention relates to a continuous and relatively instantaneous antibody-based method for detecting a target moiety and a flow immunosensor apparatus capable of conducting the method. Today, for reasons of health and safety, it is necessary to be able to rapidly detect the presence of moieties in an environment or samples which are themselves dangerous or are associated with materials which can be dangerous. These moieties may be in a medicine, a food or sample of body fluid. In addition, these moieties can be in the air or water. The moieties are referred to herein as a target or target moiety. The target may be something dangerous to health such as a toxic material present in a food, or a toxic agent present in the air or in the water supply. Keywords: Patent applications.

High Optical Density Measuring Spectrometer
See 0860

0042 Hydrocarbon Group-Type Analyzer System
P. C. Hayes, S. D. Anderson
Department of the Air Force, Washington, DC
Filed 12 Sep 88, patented 2 May 89 8p
PATENT-4 826 603 Available from Comm. of Patents
This invention concerns analysis by high performance liquid chromatography (HPLC) of crude oils and petroleum products. In one embodiment of the invention a sample is quantitatively separated into saturates, alkyl benzenes and polynuclear aromatics using a system comprising a column packed with a porous silica packing material having a polar amino-cyano bonded phase in tandem with a column packed with a tetranitorfluorenimino packing material, and a dielectric constant detector. In another embodiment of the invention a sample is qualitatively separated into saturates, olefins, and total aromatics using a system employing an olefin-selective column and a dielectric constant detector. Patents.

0043 Improved Apparatus for Countercurrent Chromatography Separations and Stable Methods for Monitoring the Effluent Thereof
O. Hisao
National Institutes of Health, Bethesda, MD
Filed 13 Dec 89 32p
PAT-APPL-7-450 111 Available from NTIS: price code N03
The patent application relates to a countercurrent chromatography apparatus and to a method of monitoring its effluent. More particularly, the invention provides an improvement to known countercurrent chromatography apparatus technology which substantially avoids the development of turbidity in the flow cell as well as the production of bubbles which interfere with the production of substantially noiseless tracings and improved separation of chemicals.

Isolation and Characterization of a Plasma Protein Which Binds to Activated C4 of the Classical Complement Pathway
See 0741

0044 Liquid Chromatographic Chiral Stationary Phase
T. D. Doyle, C. A. Brunner, E. Smith
Department of Health and Human Services, Washington, DC
Filed 9 Dec 88, patented 24 Apr 90 2p
PATENT-4 919 803 Available from Comm. of Patents
A novel packing material for liquid chromatographic use is disclosed. The packing material is prepared by covalently bonding (S)- or (R)-6-methoxy-alpha-methyl-2-naphthaleneacetic acid (naproxen) to aminopropylsilanized silica. The resulting chiral stationary phase is effective for the resolution of enantiomeric (RS)-naproxen, and of other racemic alpha-methylarylacetic acids.

0045 Method of Identifying the Composition of a Material Sample
D. W. Eckart, J. R. Shappirio
Department of the Army, Washington, DC
Filed 13 Sep 89 7p
PAT-APPL-7-406 930 Available from NTIS: price code N03
Certain material samples useful in microelectronics and other disciplines can be exceedingly sensitive to the rigors of transportation including damage and contamination. The general objective of this invention is to provide a method of identifying a material sample, particularly when the material sample is in a remote location. A more particular object of the invention is to provide such a method that permits safe shipment of the material sample, without contamination, for identification. The sample material is rubbed with an abrasive coated paper or cloth such as emery paper until streaking appears on the emery paper. The emery paper is then analyzed in the laboratory for the composition of the material sample embedded within it by a method such as energy dispersive x-ray spectroscopy (EDS). Because analytical techniques such as EDS can perform qualitative and quantitative chemical analysis on very small quantities of sample down to micron or submicron dimension, it is necessary to have down to micron or submicron dimensions, it is necessary to have only a representative sampling of the material sample in question. The emery paper accomplishes this sampling by containing the sample material because it is embedded in the abrasive material even during transportation. The types of sample materials that can be analyzed include plating on metals, metals, corrosion products, coatings, residues, glasses, ceramics, minerals, and ores. Keywords: Patent applications.

Method of Locating Underground Mine Fires
See 0832

0046 Optical Paramagnetic/Diamagnetic Gas Sensor
T. G. Giallorenzi
Department of the Navy, Washington, DC
Filed 10 Feb 88, patented 24 Oct 89 11p
PATENT-4 875 357 Available from Comm. of Patents
An improved gas sensor optically senses a signal indication proportional to the concentration of a paramagnetic/diamagnetic gas in a gaseous mixture. In a preferred embodiment of the invention a chamber is adapted to contain a gaseous mixture to be measured for the concentration of a paramagnetic/diamagnetic gas in the mixture. An optical source provides light to a movable element to be displaced by a distance proportional to the concentration of the paramagnetic/diamagnetic gas in the gaseous mixture. A photodetector circuit receives light from the movable element having a characteristic indicative of the distance that the movable element was displaced. In response to such received light, the photodetector provides a signal output proportional to the concentration of the paramagnetic/diamagnetic gas in the gaseous mixture.

0047 Organic Vapor Assay by Raman Spectroscopy
R. E. Pellenbarg, D. E. Tevault
Department of the Navy, Washington, DC
Filed 31 May 88, patented 12 Dec 89 9p
PATENT-4 886 358 Available from Comm. of Patents
This patent discloses a method of and apparatus for analyzing for low concentrations of organic material in the atmosphere without the removal of water wherein an air sample is collected and cooled to form a condensate consisting essentially of water and organic material. The condensate is analyzed by Raman spectroscopy to detect and quantify the organic material. Patents, PAT-CL-356-301.

0048 Permeation absorption sampler with multiple detection
S. Zaromb
Argonne National Lab., IL.; Department of Energy, Washington, DC
Filed 30 Mar 89 31p
PAT-APPL-7-330 654 Available from NTIS: price code A03
A system for detecting analytes in air or aqueous systems includes a permeation absorption preconcentrator sampler for the analytes and analyte detectors. The preconcentrator has an inner fluid-permeable container into which a charge of analyte-sorbing liquid is intermittently injected, and a fluid-impermeable outer container. The sample is passed through the outer container and around the inner container for trapping and preconcentrating the analyte in the sorbing liquid. The analyte can be detected photometrically by injecting with the sorbing material a reagent which reacts with the analyte to produce a characteristic color or fluorescence which is detected by illuminating the contents of the inner container with a light source and measured the absorbed or emitted light, or by producing a characteristic chemiluminescence which can be detected by a suitable light sensor. The analyte can also be detected amperometrically. Multiple inner containers may be provided into which a plurality of sorbing liquids are respectively introduced for simultaneously detecting different analytes. baffling may be provided in the outer container. A calibration technique is disclosed. 9 figs.

Process for the Purification of CI-Inhibitor
See 0794

0049 Process for the Recovery of Germanium and Gallium
D. Harbuck
Department of the Interior, Washington, DC
Filed 7 Jun 90 15p
PAT-APPL-7-536 929 Available from NTIS: price code N03
The present invention relates to a process for utilizing a synergistic effect between the solvent extractant mixture of an alpha-hydroxyoxime derivative such as 5,8-diethyl-7-hydroxydodecan-6-oxime, and an organophosphate derivative such as octylphenyl acid phosphate, to selectively extract germanium from solutions containing relatively low amounts (5 to 100 gram per liter) of free sulfuric acid.

0050 Reversal Electron Attachment Ionizer for Detection of Trace Species
M. T. Bernius, A. Chutjian
National Aeronautics and Space Administration, Pasadena, CA. Pasadena Office
Filed 5 Jun 89 34p
PAT-APPL-7-361 531 Available from NTIS: price code A03

An in-line reversal electron, high-current ionizer capable of focusing a beam of electrons to a reversal region and executing a reversal of the electrons, such that the electrons possess zero kinetic energy at the point of reversal, may be used to produce both negative and positive ions. A sample gas is introduced at the point of electron reversal for low energy electron-(sample gas) molecule attachment with high efficiency. The attachment process produces negative ions from the sample gas, which includes species present in trace (minute) amounts. These ions are extracted efficiently and directed to a mass analyzer where they may be detected and identified. The generation and detection of positive ions is accomplished in a similar fashion with minimal adjustment to potentials applied to the apparatus.

Sampling apparatus for real-time alkali monitor
See 0133

0051 Separation of Rare Earth Elements with High-Speed Countercurrent Chromatography
E. Kitazome, Y. Ito, S. Ficca
National Institutes of Health, Bethesda, MD
Filed 28 Feb 90 27p
PAT-APPL-7-485 317 Available from NTIS: price code N03

The invention relates to continuous countercurrent chromatography, and more particularly relates to methods for continuous countercurrent chromatography separation and detection of rare earth elements and compounds.

System for Analyzing Cotton
See 0569

0052 Thimble Glass Frit Nebulizer and Method
M. Akbar, R. H. Clifford, S. A. Sinex, S. G. Capar
National Institutes of Health, Bethesda, MD
Filed 14 Dec 89 26p
PAT-APPL-7-450 761 Available from NTIS: price code N03

The present invention relates to a nebulizer for converting a liquid solution into aerosol form. The nebulizer comprises a glass frit member which is thimble-shaped and has a cylindrical portion, one end of which is open and the other end of which is provided with an integral convex-shaped glass frit closure. The nebulizer further includes means for internally pressurizing the glass frit member to cause gas to pass through pores of the glass frit, and means for applying a liquid solution to the outer surface of the glass frit member. The present invention also relates to a method for converting a liquid solution into aerosol form.

CHEMISTRY: Industrial Chemistry & Process Engineering

0053 Apparatus and process for the electrolytic reduction of uranium and plutonium oxides
D. S. Poa, L. Burris, R. K. Steunenberg, Z. Tomczuk
Argonne National Lab., IL.; Department of Energy, Washington, DC
Filed 24 Jul 89 29p
PAT-APPL-7-384 195 Available from NTIS: price code A03

An apparatus and process for reducing uranium and/or plutonium oxides to produce a solid, high-purity metal. The apparatus is an electrolyte cell consisting of a first container, and a smaller second container within the first container. An electrolyte fills both containers, the level of the electrolyte in the first container being above the top of the second container so that the electrolyte can be circulated between the containers. The anode is positioned in the first container while the cathode is located in the second container. Means are provided for passing an inert gas into the electrolyte near the lower end of the anode to sparge the electrolyte and to remove gases which form on the anode during the reduction operation. Means are also provided for mixing and stirring the electrolyte in the first container to solubilize the metal oxide in the electrolyte and to transport the electrolyte containing dissolved oxide into contact with the cathode in the second container. The cell is operated at a temperature below the melting temperature of the metal product so that the metal forms as a solid on the cathode.

Bis(4-(3,4-Dimethylenepyrrolidyl)-Phenyl) Methane
See 0066

0054 Centrifugal contactor modified for end stage operation in a multistage system
R. T. Jubin
Oak Ridge National Lab., TN.; Department of Energy, Washington, DC
Filed 13 Jun 89 29p
PAT-APPL-7-365 636 Available from NTIS: price code A03

The present invention relates generally to centrifugal contactors in a multistage or cascade system for separating liquids of different weight phases, and more particularly to the modification of the centrifugal contactors functioning as the end stages in the cascade for enabling the cascade to continue operation when an end stage becomes inoperative. This invention was made as a result of work under contract AC05-84OR21400 between Martian Marietta Energy Systems, Inc., and the US Department of Energy. 4 figs.

0055 Centrifugal contactor with liquid mixing and flow control vanes
R. T. Jubin, J. D. Randolph
Oak Ridge National Lab., TN.; Department of Energy, Washington, DC
Filed 13 Jun 89 18p
PAT-APPL-7-365 400 Available from NTIS: price code A03

The invention is directed to an improvement in centrifugal contactors of a type used for solvent extraction systems in nuclear reactor fuel reprocessing. The centrifugal contactor is vertically oriented and is provided with an annular vertically oriented mixing chamber between the rotor housing and the rotor wherein the mixing of the process liquids

such as the aqueous and organic phases of the solvent extraction process used for nuclear fuel reprocessing takes place. A set of helically disposed vanes carried by the housing is positioned in the lower region of the mixing chamber at a location below the inlets of the process liquids for the purpose of urging the liquids in an upward direction. The upper region of the mixing vessel above the inlets for the process liquids is also provided with a helically disposed vane set carried by the housing which urges the liquid in a downward direction when the liquid flow rates through the inlets are relatively high and liquid contacts the vane set in the upper region. The use of these opposing vane sets in the mixing zone within a desirable level while providing a greater degree of mixing of the process liquids which generates more liquid surface area for contact and improves the mass transfer between the process liquids. The van set in the lower region also significantly reduces or eliminates the formation of vortices which induces cavitation and air entrainment in the process liquids which detract from the efficiency of the centrifugal contactor. 2 figs.

0056 Combined Air and Water Pollution Control System
B. C. Wolverton, L. Jarrell
National Aeronautics and Space Administration, Bay Saint Louis, MS. John C. Stennis Space Center
Filed 26 May 89 15p
PAT-APPL-7-357 938 Available from NTIS: price code A03
A bioaquatic air pollution control system for controlling both water and atmospheric pollution is disclosed. The pollution control system includes an exhaust for directing polluted gases out of a furnace and a fluid circulating system which circulates fluid, such as waste water, from a source, past the furnace where the fluid flow entrains the pollutants from the furnace. The combined fluid and pollutants are then directed through a rock/plant/microbial filtering system. A suction pump pumps the treated waste water from the filter system past the exhaust to again entrain more pollutants from the furnace where they are combined with the fluid (waste water) and directed to the filter system.

0057 Combined coal gasifier and fuel cell system and method
F. D. Gmeindl, R. A. Geisbrecht
Department of Energy, Morgantown, WV. Morgantown Energy Technology Center
Filed 26 Jun 89 21p
PAT-APPL-7-371 144 Available from NTIS: price code A03
This report describes a process whereby a molten carbonate fuel cell is combined with a catalytic coal or coal char gasifier for providing the reactant gases comprising hydrogen, carbon monoxide and carbon dioxide used in the operation of the fuel cell. These reactant gases are stripped of sulfur compounds and particulate material and are then separated in discrete gas streams for conveyance to appropriate electrodes in the fuel cell. The gasifier is arranged to receive the reaction products generated at the anode of the fuel cell by the electricity-producing electrochemical reaction therein. These reaction products from the anode are formed primarily of high temperature steam and carbon dioxide to provide the steam, the atmosphere and the heat necessary to endothermically pyrolyze the coal or char in the presence of a catalyst. The reaction products generated at the cathode are substantially formed of carbon dioxide which is used to heat air being admixed with the carbon dioxide stream from the gasifier for providing the oxygen required for the reaction in the fuel cell and for driving an expansion device for energy recovery. A portion of this carbon dioxide from the cathode may be recycled into the fuel cell with the air-carbon dioxide mixture. 1 fig.

Combined method for simultaneously dewatering and reconstituting finely divided carbonaceous material
See 0387

0058 Extraction of Recovery of Plasticizers from Solid Propellants and Munitions
W. S. Melvin
Department of the Air Force, Washington, DC
Filed 16 Oct 89 22p
PAT-APPL-7-422 061 Available from NTIS: price code N03
A method to extract and recover plasticizers and their stabilizers from solid propellants, explosives, and pyrotechnics (PEP source compositions) employs near critical liquid (NCL) or supercritical fluid (SCF) CO2 as the solvent. The extraction and ingredient recovery method provides an environmentally acceptable alternative to traditional open burning and destruction of PEP source compositions. CO2 solvent is nontoxic, nonflammable, noncorrosive, inexpensive, and does not generate any additional toxic or hazardous wastes. The solvent is totally inert when it is confined, pressurized, and possibly heated in direct contact with an energetic propellant heated in direct contract motor or similar pressure vessel. CO(2) readily undergoes a gas-to-liquid phase change to NCL readily undergoes a gas-to-liquid phase change to NCL conditions when confined and compressed to a pressure of 831 psig or greater at ambient temperature. By further increasing the pressure and temperature of NCL CO2 to 1058 psig and 31.3 C or greater, respectively, SCF conditions of CO2 are obtained. Patent applications.

Method and Composition for Controlling Dust Emissions
See 0829

Method of Growing Industrial Grade Diamond
See 0610

Organometallic Antimony Compounds Useful in Chemical Vapor Deposition Processes
See 0086

Process for Acid Leaching of Manganese Oxide Ores Aided by Hydrogen Peroxide
See 0836

Sampling apparatus for real-time alkali monitor
See 0133

CHEMISTRY: Synthetic Chemistry

0059 (1-(Diorganooxyphosphonyl)-Methyl)-2,4- and -2,6-Diamido Benzenes
J. A. Mikroyannidis, D. A. Kourtides
National Aeronautics and Space Administration, Moffett Field, CA. Ames Research Center
Filed 28 May 87, patented 5 Sep 89 7p
PATENT-4 864 050 Available from Comm. of Patents
1-((Diorgano oxyphosphonyl) methyl)-2,4- and -2,6-dinitro and diamino benzenes are prepared by nitrating an (organophosphonyl) methyl benzene to produce the dinitro compounds which are then reduced to the diamino compounds. The organo grounds (alkyl, haloalkyl, aryl) on the phospho-

rus may be removed to give the free acids (HO)2P(double bond O)single bond. The diamino compounds may be polymerized with dianhydrides or diacyl halides to produce fire and flame resistant polymers which are useful in the manufacture of aircraft structures.

0060 2,2-Dinitrobutane 1,4-Diol and Monoesters
M. E. Sitzmann
Department of the Navy, Washington, DC
Filed 6 May 83, patented 8 Oct 85 4p
PATENT-4 546 200 Available from Comm. of Patents
This invention relates to alcohols and more particularly to energetic polynitro substituted diols. Polynitro-hydroxy terminated diols are being used to prepare energetic binders for propellants and explosives. Lower molecular weight polynitro alcohols have been used as building blocks to prepare these diols. Because of the limitation on the choice of these building blocks, the high energy diols have been limited to those having gem-dinitro groups in the Beta position to the hydroxy groups, HOCH2C(NO2)2, C(NO2)2CH2OH. Unfortunately while these diols have excellent energy content, they are unstable in the presence of weak bases or nucleophiles (such as atmospheric moisture) or oxygen and nitrogen containing components of the energetic binder systems. Accordingly, an object of this invention is to provide new organic compounds. Another object of this invention is to provide new energetic polynitro organic compounds. A further object of this invention is to provide new polynitro organic compounds which can be used to synthesize new stable, energetic polynitrodiols. These and other objects of this invention are accomplished by providing 2,2-dinitrobutane-1,4-diol and 4-monoesters thereof. Patents.

0061 2,4,4,5,5,6,6-Heptafluoro-2-Tri-Fluoromethyl-3-Oxaheptane-1,7-Diol Polyformal and Method of Preparation
H. D. Adolph, J. M. Goldwasser
Department of the Navy, Washington, DC
Filed 5 May 87, patented 26 Apr 88 3p
PATENT-4 740 628 Available from Comm. of Patents
An object of this invention is to provide a new curable polyfluoro prepolymer. Another object of this invention is to provide a new curable polyfluoro prepolymer which is miscible with conventional plasticizers, curing agents, and other polymers. Other objects of this invention are to provide a curable polyfluoro prepolymer which may be used to provide a binder in castable or extrudable composites and to provide an energetic, curable prepolymer for use in a binder in castable or extrudable explosive or propellant compositions. These and other objects of this invention are accomplished by providing 2,4,4,5,5,6,6-heptafluoro-2-trifluoromethyl-3-oxaheptane-1,7-diol polyformal, HOCH2CF2CF2CF2OCF(CF3)CH2O(CH2OCH2CF2CF2CF2OCF(CF3)CH20)(n)H, wherein n > 1, which is prepared by reacting 2,4,4,5,5,6,6-heptafluoro-2-trifluoromethyl-3-oxaheptane-1,7-diol with formaldehyde in 80-90% sulfuric acid. Keywords: Patents.

0062 Acetylene Terminated Aromatic Amide Monomers
R. C. Evers, T. Abraham, E. J. Soloski
Department of the Air Force, Washington, DC
Filed 24 Aug 87, patented 4 Jul 89 4p
PATENT-4 845 286 Available from Comm. of Patents
This invention relates to acetylene-terminated aromatic amide monomers. Acetylene-terminated compounds, with phenylene-R backbones (e.g. phenylene ether, phenylene sulfone, and the like) show promise for use in the preparation of matrix resins and adhesives for composite structures. The compounds can be polymerized thermally without the evolution of volatile by-products, thereby obviating the problem of void formation in composite structures and molded articles. These compounds tend to lack toughness, possibly due to the relatively short phenylene-R backbones between the acetylene cure sites. It is an object of the present invention to provide novel acetylene-terminated compounds. It is another object of the present invention to provide a method for producing novel acetylene-terminated compounds. Patents.

0063 Acetylene Terminated Aspartimides and Resins Therefrom
P. M. Hergenrother, J. W. Connell, S. J. Havens
National Aeronautics and Space Administration, Hampton, VA. Langley Research Center
Filed 24 Mar 89, patented 26 Dec 89 20p
PATENT-4 889 912 Available from Comm. of Patents
Acetylene terminated aspartimides are prepared using two methods. In the first, an amino-substituted aromatic acetylene is reacted with an aromatic bismaleimide in a solvent of glacial acetic acid and/or m-cresol. In the second method, an aromatic diamine is reacted with an ethynyl containing maleimide, such an N-(3-ethynyl phenyl) maleimide, in a solvent of glacial acetic acid and/or m-cresol. In addition, acetylene terminated aspartimides are blended with various acetylene terminated oligomers and polymers to yield composite materials exhibiting improved mechanical properties.

0064 Automated Peptide Design and Synthesis
C. Saxinger
Department of Health and Human Services, Washington, DC
Filed 25 Aug 89 56p
PAT-APPL-7-398 458 Available from NTIS: price code N03
An automated peptide design and synthesis method is provided, wherein peptides are synthesized on interior, inward facing surfaces of reservoirs formed in a solvent resistant substrate. Novel substrates, as well as novel solutions for storing protected carboxyl terminal amino acids, are also provided.

0065 Bifunctional DTPA-Type Ligand
O. A. Gansow, M. W. Brechbiel
National Institutes of Health, Bethesda, MD
Filed 26 Mar 90 25p
PAT-APPL-7-498 319 Available from NTIS: price code N03
The subject matter of the invention relates to bifunctional cyclohexyl DTPA ligands and methods of using these compounds. Specifically, such ligands are useful for radiolabeling proteins with radioactive metals, and can consequently be utilized with respect to radioimmunoimaging and/or radioimmunotherapy.

0066 Bis(4-(3,4-Dimethylenepyrrolidyl)-Phenyl) Methane
R. M. Ottenbrite
National Aeronautics and Space Administration, Hampton, VA. Langley Research Center
Filed 19 Jul 88, patented 25 Jul 89 6p
PATENT-4 851 544 Available from Comm. of Patents
It is the primary object of the present invention to prepare high temperature polymeric materials, especially linear aromatic polyimides, which maintain their integrity and tough-

ness during long exposure times at elevated temperatures. According to the present invention, this object is achieved, and the attending benefits are obtained, by first providing the bis(exocyclodiene) bis(4-(3,4-dinethylene pyrrolidyl) phenyl) methane, which is formed from the monomer N-phenyl 3,4-dimethylene pyrrolidine. This bis-(exocyclodiene) undergoes Diels-Alder reaction with a bismaleimide without the evolution of gaseous by-products, to form the aromatic polyimide.

Block Patterning of the Metallization of Polyvinylidene Fluoride Transducers
See 0250

0067 Boron-Containing Organosilane Polymers and Ceramic Materials Thereof
S. R. Riccitiello, M. S. Hsu, T. S. Chen
National Aeronautics and Space Administration, Moffett Field, CA. Ames Research Center
Filed 11 Aug 88, patented 25 Jul 89 10p
PATENT-4 851 491 Available from Comm. of Patents
The present invention relates to a polyorgano borosilane ceramic precursor polymer comprising a plurality of repeating units of the formula: (R(sup 1) single bond B)(sub p) being linked together at B by second units of the formula: single bond (R sup 2) single bond (Si single bond R sup 3) single bond (sub q), where R(sup 1) is a lower alkyl, cycloalkyl, phenyl, or (R(sup 2)R(sup 3) single bond Si single bond B single bond)(sub n) and R(sup 2) and R(sup 3) are each independently selected from hydrogen, lower alkyl, vinyl, cycloalkyl, or aryl, n is an integer between 1 and 100; p is an integer between 1 and 100; and q is an integer between 1 and 100. These materials are prepared by combining an organo borohalide of the formula R(sup 4) single bond B single bond (X sup 1) (sub 2) where R(sup 4) is selected from halogen, lower alkyl, cycloalkyl, or aryl, and an organo halosilane of the formula: R(sup 2)(R sup 3)Si(X sup 2)(sub 2) where R(sup 2) and R (sup 3) are each independently selected from lower alkyl, cycloalkyl, or aryl, and X(sup 1) and X(sup 2) are each independently selected from halogen, in an anhydrous aprotic solvent having a boiling point at ambient pressure of not greater than 160 C with in excess of four equivalents of an alkali metal, heating the reaction mixture and recovering the polyorgano borosilane. These silicon boron polymers are useful to generate high-temperature ceramic materials, such as SiC, SiB4, and B4C, upon thermal degradation above 600 C.

Cellular Thermosetting Fluorodiepoxide Polymers
See 0586

0068 Colloidal polyaniline
S. P. Armes, M. Aldissi
Los Alamos National Lab., NM.; Department of Energy, Washington, DC
Filed 3 Feb 89 14p
PAT-APPL-7-305 817 Available from NTIS: price code A03
This report describes the preparation of a processable electrically conductive latex polymer. The compositions include colloidal particles of an oxidized, polymerized amino-substituted aromatic monomer, a stabilizing effective amount of a random copolymer containing amino-benzene type moieties as side chain constituents, and dopant anions.

0069 Colloidal polypyrrole
S. P. Armes, M. Aldissi
Los Alamos National Lab., NM.; Department of Energy, Washington, DC
Filed 3 Feb 89 15p
PAT-APPL-7-305 816 Available from NTIS: price code A03
This report describes the preparation of a processable electrically conductive latex polymer. The compositions include colloidal particles of an oxidized, polymerized aromatic heterocyclic monomer, and a stabilizing effective amount of a vinyl pyridine-containing polymer and dopant anions.

Combination Primer/Topcoat Coating
See 0537

0070 Conductive Polymers of Transition-Metal Complexes Coordinated by a Diamino-Dichalcogen-Benzene Compound
O. K. Kim
Department of the Navy, Washington, DC
Filed 28 Mar 89, patented 29 Aug 89 9p
PATENT-4 861 859 Available from Comm. of Patents
Polymeric metal complexes were prepared by coordination reactions of 2,5-diamino-1,4-benzenedithiol (DADT) with divalent metal halides (cobalt chloride, iron chloride, copper chloride and nickel chloride) in an aqueous alkaline solution at reflux temperatures. A black precipitate which conducted electricity was formed. Resistivity of the material increased upon exposure to air but decreased when oxygen was removed from the material. Patents.

0071 Copolyimide with a Combination of Flexibilizing Groups
T. L. Stclair, H. D. Burks, D. J. Progar
National Aeronautics and Space Administration, Hampton, VA. Langley Research Center
Filed 9 Jul 87, patented 6 Jun 89 11p
PATENT-4 837 300 Available from Comm. of Patents
Copolyimides are prepared by reacting one or more aromatic dianhydrides with a meta-substituted phenylene diamine and an aromatic bridged diamine. The incorporation of meta-substituted phenylene diamine derived units and bridged aromatice diamine derived units into the linear aromatic polymer backbone results in a copolyimide of improved flexibility, processability, and melt-flow characteristics. The copolyimides are especially useful as thermoplastic hot-melt adhesives.

Crystal Growth Apparatus
See 0711

0072 Curable Polyether Compositions
A. A. DeFusco, E. C. Martin
Department of the Navy, Washington, DC
Filed 23 May 86, patented 4 Oct 88 4p
PATENT-4 775 729 Available from Comm. of Patents
Pentadienyl ether terminated polyethers and maleimidomethyl carbonate terminated polyethers are selectively combined via a Diels-Alder reaction at room temperature. The resulting aliphatic copolyethers are characterized by having at least two chemically combined N(1)-oxycarbonyloxymethyl-4-oxymethyltetrahydrophthalimido groups interposed between polyether radicals within the copolymer chain. The aliphatic polyether precursors terminated with pentadienyl ether groups are synthesized by reacting an aliphatic hydroxy terminated polyether with a metal alkoxide to form at least the bis alkoxide derivative. The alkoxide derivative is then reacted with a halogen substituted penta-

diene yielding the bis or tris pentadiene ether terminated polyether for use in the copolymer synthesis. Keywords: Patents.

Delignification of Lignocellulosic Materials with Monoperoxysulfuric Acid
See 0597

Derivatization of Amines for Electrochemical Detection
See 0712

0073 Direct vapor/solid synthesis of mercuric iodide using compounds of mercury and iodine
N. L. Skinner
EG and G Energy Measurements, Inc., Las Vegas, NV.; Department of Energy, Washington, DC
Filed 24 Jul 89 16p
PAT-APPL-7-384 197 Available from NTIS: price code A03

A process is disclosed for producing high purity mercuric iodide by passing a gaseous source of a mercuric compound through a particulate bed of a low vapor pressure iodide compound which is maintained at an elevated temperature which is the lower of either: (a) just below the melting or volatilization temperature of the iodide compound (which ever is lower); or (b) just below the melting point of the other reaction product formed during the reaction; to cause the mercuric compound to react with the iodide compound to form mercuric iodide which then passes as a vapor out of the bed into a cooler condensation region.

0074 Energetic Diethers and Process for their Preparation
R. P. Chapman
Department of the Air Force, Washington, DC
Filed 4 Sep 88, patented 8 Aug 89 5p
PATENT-4 855 508 Available from Comm. of Patents

The invention comprises a novel preparation of energetically substituted diether compounds and novel diether compounds not previously reported. In one embodiment certain isomeric forms of dibromoalkanes are converted to corresponding isomers of bromoalkyl trifluoromethanesulfonate esters by reaction with silver trifluoromethanesulfonate (triflate) in a variety of solvents. The triflate substituent in the bromoalkyl triflate esters is than easily displaced by alcohols including non-nucleophilic ones such as those that contain nitro. The intermediates are similarly reacted to make energetic diethers, selectively under mild conditions. The energetically substituted diether compounds are particularly useful as energetic curatives and plasticizers for rocket propellant binders as well as stable solid oxidizers and industrial explosives. Pat-568-589.

Enzymatic Processing of Materials Containing Chromium and Protein
See 0725

Fabrication of Nanometer Single Crystal Metallic CoSi2 Structures on Si
See 0899

0075 Fluoroaliphatic Polyamide Synthesized via Peptide Blocking Group and Coupling Technique
A. E. Mera, J. R. Griffith
Department of the Navy, Washington, DC
Filed 28 Aug 89 26p
PAT-APPL-7-400 197 Available from NTIS: price code N03

The present invention relates to the synthesis of fluoroaliphatic polyamides and monomers thereof. Novel fluorodiamines having the following structure: NH2(CH2)(x)OCNH(CH2)(y)(CF2)(n)(CH2)(z)NHCO(CH2)(x)NH2 and acid salts thereof, wherein n, x, y, and z are integers equal to or greater than 1, methods of making these fluorodiamines, fluorinated polyamides produced from these fluorodiamines, and methods of making these polymers, are disclosed. In one example, an alkyl fluorodiamine is reacted with an active ester of an omega amino acid blocked with by a carbobenzoxy group at one end and esterified to a p-nitrophenol group at the other. The reaction product is acidified to produce the fluorodiamine acid salt. This fluorodiamine acid salt is condensed with an acid chloride to produce a novel fluorinated polyamide. The novel fluorinated polyamides may be used, for example, in ropes for anchoring ships. Keywords: Nylon, Acid halides, Patent applications.

Formation of High T(c) Superconducting Films by Organometallic Chemical Vapor Deposition
See 0903

Hanging Drop Crystal Growth Apparatus and Method
See 0731

Heterogeneous Composite and Method of Making
See 0257

High Temperature Insulators
See 0601

0076 In-Situ Formation of Hardening Elements by Electrochemical Techniques
D. R. Rolison, W. E. O'Grady
Department of the Navy, Washington, DC
Filed 16 Oct 89 37p
PAT-APPL-7-421 899 Available from NTIS: price code N03

Palladium is enriched with respect to the 106 isotope when used as an anode at ambient temperatures in an electrolytic bath comprising D2O and a lithium, especially where the cathode is platinum. Significant amounts of Rh and Ag also form at the electrolyzed Pd anode. The enrichment of Pd by with respect to 106Pd, and quite likely the formation of the Rh and Ag, apparently result from nuclear processes. Keywords: Military publications; Periodicals; Patent applications.

Low-loss binder for hot pressing boron nitride
See 0605

Macrocyclic Chelates and Methods of Use Thereof
See 0663

Metal Ternary Sulfides
See 0606

0077 Method and apparatus for synthesizing various short chain hydrocarbons
C. Colmenares
Lawrence Livermore National Lab., CA.; Department of Energy, Washington, DC
Filed 5 May 89 19p
PAT-APPL-7-347 765 Available from NTIS: price code A03

A method and apparatus, including novel photocatalysts, are disclosed for the synthesis of various short chain hydrocarbons. Light-transparent SiO(sub 2) aerogels doped with photochemically active uranyl ions are fluidized in a fluidized-bed reactor having a transparent window, by hydrogen and CO, C(sub 2)H(sub 4) or C(sub 2)H(sub 6) gas mixtures, and exposed to radiation from a light source external

to the reactor, to produce the short chain hydrocarbons. 1 fig., 1 tab.

Method and Apparatus for Testing Materials Using Strain and Moisture Sorption
See 0564

Method for Growing Patterned Thin Films of Superconductors
See 0911

Method for Stabilization of Pan-Based Carbon Fibers
See 0608

0078 Method for the Sulfurization of Phosphorous Groups in Compounds
S. L. Beaucage, J. B. Regan, R. P. Iyer
Department of Health and Human Services, Washington, DC
Filed 2 Oct 89 35p
PAT-APPL-7-415 710 Available from NTIS: price code N03
The present invention provides a method of sulfurizing phosphorus containing compounds, which is reliably useful and which can be used when automating the preparation of such compounds. The current methodology for the sulfurization of oligonucleotide phosphite triesters via standard 'phosphoramidite' chemistry uses a solution of elemental sulfur (S8) in carbon disulfide: pyridine, triethylamine (1 : 1 : 0.1). In an attempt to alleviate problems with unreliability and erraticacy, a 'nucleoside-H-phosphmate' chemical approach has recently been suggested in the automated preparation of oligonucleotides. The method employs sulfurization with elemental sulfur in one step outside the instrument.

0079 Method of Controlling a Resin Curing Process
C. N. Webster, R. O. Scott
National Aeronautics and Space Administration, Houston, TX. Lyndon B. Johnson Space Center
Filed 30 Apr 87, patented 7 Mar 89 12p
PATENT-4 810 438 Available from Comm. of Patents
The invention relates to an analytical technique for controlling the curing process of fiber-reinforced composite materials that are formed using thermosetting resins. The technique is the percent gel method and involves development of a time-to-gel equation as a function of temperature. From this equation a rate-of-gel equation is then determined, and a percent gel is calculated which is the product of rate-of-gel times time. Percent gel accounting is used to control the proper pressure application point in an autoclave cure process to achieve desired properties in a production composite part.

0080 Method of Modifying the Dielectric Properties of an Organic Polymer Film
M. Binder, R. J. Mammone
Department of the Army, Washington, DC.; National Aeronautics and Space Administration, Washington, DC
Filed 12 Jun 89 10p
PAT-APPL-7-374 125 Available from NTIS: price code A02
This invention relates in general to a method of modifying the dielectric properties of an organic polymer film by ion implantation and in particular to such a method for modifying the dielectric properties of a film of a Poly-p-Xylylene formed by vapor deposition polymerization. Poly-p-Xylylenes, also known by their trade name of Parylene, are well known conformal coatings that are primarily used as insulators and isolators in electronics. These materials are interesting because of their ability to provide ultrathin films that conform to substrates of varied geometrical shapes and irregularities.

0081 Method of Reacting Immiscible Liquids with a Catalyst-Impregnated Membrane
F. Taylor
Department of Agriculture, Washington, DC
Filed 6 May 86, patented 3 Jul 90 2p
PATENT-4 939 090 Available from Comm. of Patents
Reactions involving immiscible liquids are carried out by forcing one immiscible liquid through a catalyst-impregnated membrane. In a preferred embodiment, oil is hydrolyzed by passing the oil on one side of a hydrophilic, microporous membrane impregnated with an enzyme catalyst such as lipase, and passing an aqueous liquid on the other side while forcing oil through the membrane by pressure. Oil flowing through the membrane mixes with the aqueous liquid and resultant immiscible phases are separated. Hydrolysis of the oil into glycerol and fatty acids occurs at catalyst sites in the membrane. The membrane is impregnated with the enzyme catalyst by passing an aqueous solution of the enzyme in contact with the membrane so that the enzyme is adsorbed by the membrane, and removing the aqueous solution after the enzyme is adsorbed.

Microbial Production of a Novel Compound, 7,10-Dihydroxy-8-octadecenoic Acid from Oleic Acid
See 0763

0082 Molecules with Enhanced Electronic Polarizabilities Based on Defect-Like States in Conjugated Polymers
D. N. Beratan
National Aeronautics and Space Administration, Pasadena, CA. Pasadena Office
Filed 10 Oct 89 22p
PAT-APPL-7-418 611 Available from NTIS: price code N03
Highly conjugated organic polymers typically have large non-resonant electronic susceptibilities, which give the molecules unusual optical properties. To enhance these properties, defects are introduced into the polymer chain. Examples include light doping of the conjugated polymer and synthesis, conjugated polymers which incorporate either electron donating or accepting groups, and conjugated polymers which contains a photoexcitable species capable of reversibly transferring its electron to an acceptor. Such defects in the chain permit enhancement of the second hyperpolarizability by at least an order of magnitude.

New Anti-HIV (Human Immunodeficiency Virus) Compounds Belonging to Aurintricarboxylic Acid
See 0667

0083 New Condensation Polyimides Containing 1,1,1-Triaryl-2,2,2-Trifluoroethane Structures
W. B. Alston, R. F. Gratz
National Aeronautics and Space Administration, Cleveland, OH. Lewis Research Center
Filed 29 Oct 86, patented 4 Jul 89 18p
PATENT-4 845 167 Available from Comm. of Patents
The invention relates to a condensation polyimide containing a 1,1,1-triaryl 2,2,2-trifluoroethane structure and other related condensation polyimides. The process for their preparation, which comprises polymerization of a cyclic dianhydride with a diamine is also covered.

0084 Nonintrusive Method and Apparatus for Monitoring the Cure of Polymeric Materials
D. F. Johnston, R. L. Fox
National Aeronautics and Space Administration, Hampton, VA. Langley Research Center
Filed 16 Feb 88, patented 2 Jan 90 8p
PATENT-4 891 591 Available from Comm. of Patents
The invention is a nonintrusive method of monitoring the cure of a polymeric material using an electromagnetic field to sense a change of resistance of the polymeric material in the electromagnetic field that occurs during curing. This change of resistance is used to vary the impedance of an alternating voltage power supply that produces the electromagnetic field and which change of impedance is measured periodically or continuously to monitor the cure of said polymeric material. The apparatus for practicing the method of this invention may include a nonintrusive sensing head providing an inner, electromagnetic core within an open ended outer pot formed of magnet material. The open end of the pot core is positioned from a selected area of the surface of a sheet of the polymeric material. An alternating voltage supply circuit includes an inductance coil around the electromagnetic core and capacitor connected in parallel with the inductance coil forms a resonant tank circuit when energized. The resulting change in resistance of the polymeric material opposite the open end, a function of the curing, is measured as a corresponding change in the impedance of the power supply circuit to thereby monitor the cure of the polymeric material in the selected area.

0085 Novel Phenol Derivative and Process for the Production of the Same
B. Tomita, C. Hse
Forest Service, Washington, DC
Filed 29 Aug 90 31p
PAT-APPL-7-574 014 Available from NTIS: price code N03
The present invention relates to a novel phenol derivative composition which is a thermosetting resin and to a process for the production of the same. In particular, it relates to a phenol derivative composition with excellent durability, heat resistance, hydrolysis resistance and setting properties, which is a condensation polymer of a phenol and an amino compound and which is less or freed of condensation between amino compounds, and to a process for effectively producing the same. A novel phenol derivative composition according to the present invention is industrially useful as a molding material, a laminate board, an adhesive, etc.

Novel Polyimide Compositions Based on 4,4': Isophthaloyldiphthalic Anhydride (Idpa)
See 0587

0086 Organometallic Antimony Compounds Useful in Chemical Vapor Deposition Processes
J. C. Pazik
Department of the Navy, Washington, DC
Filed 29 Sep 89 20p
PAT-APPL-7-415 505 Available from NTIS: price code N03
The invention relates to organometallic antimony compounds and their halide derivatives which are useful as sources or precursors for sources in chemical vapor deposition (CVD) processes such as those employed in the fabrication of semiconductors. Organometallic antimony compounds having increased stability that are useful in chemical vapor deposition processes are provided which comprise stibines containing sterically-demanding ligands, stibines lacking beta hydrogen atoms, or aromatic stibines. These compounds will generally have the formula wherin R is selected from the group consisting of neopentyl, 2-ethylbutyl, 1-ethylpropyl, perhaloalkanes having 3-5 carbon atoms, benzyl, fluoro-substituted phenyl, cyclopentyl, and pentamethylcyclopentadienyl; X is selected from the group consisting of Br, Cl, I and H; and wherein n is an integer from 1 to 3. These compounds exhibit increased thermal stability and are thus advantageously used as substitutes for arsenic or other group V metals in chemical vapor deposition processes. Because of the bulky ligand group bound to the antimony and/or the lack of beta hydrogen atoms in the ligand, these organometallic stibines are less prone to decompose prematurely and thus exhibit greater thermal stability than previously known alkyl antimony hydride compounds. Patent applications.

0087 Pendant Benzazole Rigid-Rod Aromatic Heterocyclic Polymer
T. T. Tsai, F. E. Arnold
Department of the Air Force, Washington, DC
Filed 13 Aug 87, patented 30 May 89 6p
PATENT-4 835 246 Available from Comm. of Patents
This invention relates to para-ordered aromatic heterocyclic polymers. In one aspect, this invention relates to a method for synthesizing polymers. In general, the class of aromatic heterocyclic extended chain polymers are well known for their outstanding thermal, physical and chemical properties. These polymers generally exhibit excellent modulus and tenacity properties, but lack good properties when in compression, which limits their use as reinforcing structural fibers. It is an object of the present invention to provide novel aromatic heterocyclic polymers which exhibit improved compressive properties. The polymers of the present invention are prepared by reacting an amine monomer with heterocyclic terephthalic acid. The polymers may be prepared by: mixing an amino monomer with or without oxidation protecting atoms or groups, e.g., Hydrochloric acid groups, with a preliminary solvent of phosphoric acid having a relatively low phosphorous pentoxide content, about 63 to 83%, preferably below about 80%; heating and optionally placing the resulting mixture under reduced pressure to remove any volatile protecting atoms or groups present and provide a mixture of the amino monomer in the preliminary solvent; adding the heterocyclic terephtalic acid monomer to the mixture to provide a mixture of amino monomer and acid monomer in the preliminary solvent; increasing the phosphorous pentoxide content of the mixture to provide a reaction medium in which the percentage of phosphorous pentoxide should be about 82 to 86% PO, preferably about 82 to 84% at the end of the polymerization; and causing polymerization of the monomers at a temperature of about 100 to 200 C for about 18 to 36 hours. Keywords: Patents.

0088 Pentafluorothio Polynitroaliphatic Explosives
M. E. Sitzmann, W. H. Gilligan
Department of the Navy, Washington, DC
Filed 24 Jun 88, patented 18 Jul 89 7p
PATENT-4 849 540 Available from Comm. of Patents
An object of this invention is to provide new energetic explosive compounds. Other objects of this invention are to provide new pentafluorothio polyaliphatic explosives; to provide new high melting pentafluorothio polyaliphatic explosives; to provide new high energy, high density explosives; and to provide new high energy explosives having good

thermal stabilities. This invention provides new high energy, high density, high melting explosives which contain both pentafluorothioethyl, -CH2CH2SF5, groups and polynitroaliphatic groups. These compounds are prepared by the reaction of pentafluorothioethanol, F5SCH2OH, with selected polynitroaliphatic reactants. The pentafluorothioethanol can be prepared by the reduction of pentafluorothioacetyl chloride with lithium aluminum hydride. Keywords: Patents.

Phenylcycloalkylamine Compounds as Antiepileptics
See 0672

0089 Phthalonitrile Monomers Containing Imide and/or Phenoxy Linkages, and Polymers Thereof
T. M. Keller
Department of the Navy, Washington, DC
Filed 30 Apr 90 26p
PAT-APPL-7-516 956 Available from NTIS: price code N03
This patent application discloses a highly aromatic oligomeric imide-containing phthalonitriles that are prepared by reacting an aromatic dianhydride with an aromatic or aliphatic diamine and endcapping the resulting reaction product with 4-aminophthalonitrile. The prepolymers are highly stable to storage. When heated above their melting or softening points, they polymerize to a thermosetting polymeric material useful as an advanced matrix material. In the case where the oligomeric monomers are produced by reacting dianhydrides with aromatic diamines, they polymerize to form high-temperature adhesives. Keywords: Patent applications, Phthalonitrile monomers, Imides, Phenoxy linkages, Polymers, Advanced matrix material.

Polycarbonate Article with Chemical Resistant Coating
See 0559

0090 Polyimides with Carbonyl and Ether Connecting Groups Between the Aromatic Rings
P. M. Hergenrother, S. J. Havens
National Aeronautics and Space Administration, Hampton, VA. Langley Research Center
Filed 9 Nov 89 24p
PAT-APPL-7-433 812 Available from NTIS: price code N03
New polyimides have been prepared from the reaction of aromatic dianhydrides with novel aromatic diamines containing carbonyl and ether connecting groups between the aromatic rings. Several of these polyimides are shown to be semi-crystalline as evidenced by wide angle x ray diffraction and differential scanning calorimetry. Most of the polyimides form tough solvent resistant films with high tensile properties. Several of these materials can be thermally processed to form solvent and base resistant moldings.

Porous ceramics and method for making
See 0619

0091 Predictive Aging of Polymers
E. F. Cuddihy, P. B. Willis
National Aeronautics and Space Administration, Pasadena, CA. Pasadena Office
Filed 16 Jun 89 15p
PAT-APPL-7-366 957 Available from NTIS: price code A03
A method of predicting aging of polymers operates by heating a polymer in the outdoors to an elevated temperature until a change of property is induced. The test is conducted at a plurality of temperatures to establish a linear Arrhenius plot which is extrapolated to predict the induction period for failure of the polymer at ambient temperature. An Outdoor Photo Thermal Aging Reactor (OPTAR) is also described including a heatable platen for receiving a sheet of polymer, means to heat the platen, and switching means such as a photoelectric switch for turning off the heater during dark periods.

0092 Process for Crosslinking Methylene-Containing Aromatic Polymers with Ionizing Radiation
V. L. Bell, S. J. Havens
National Aeronautics and Space Administration, Hampton, VA. Langley Research Center
Filed 11 Mar 86, patented 20 Mar 90 11p
PATENT-4 910 233 Available from Comm. of Patents
A process for crosslinking aromatic polymers containing radiation-sensitive methylene groups (-CH2-) by exposing the polymers to ionizing radiation thereby causing crosslinking of the polymers through the methylene groups is described. Crosslinked polymers are resistant to most organic solvents such as acetone, alcohols, hydrocarbons, methylene, chloride, chloroform, and other halogenated hydrocarbons, to common fuels and to hydraulic fluids in contrast to readily soluble uncrosslinked polymers. In addition, the degree of crosslinking of the polymers depends upon the percentage of the connecting groups which are methylene which ranges from 5 to 50 pct and preferably from 25 to 50 pct of the connecting groups, and is also controlled by the level of irradiation which ranges from 25 to 1000 Mrads and preferably from 25 to 250 Mrads. The temperature of the reaction conditions ranges from 25 to 200 C and preferably at or slightly above the glass transition temperature of the polymer. The crosslinked polymers are generally more resistant to degradation at elevated temperatures such as greater than 150 C, have a reduced tendency to creep under load, and show no significant embrittlement of parts fabricated from the polymers.

0093 Process for degrading hypochlorite
W. P. Huxtable, W. L. Griffith, A. L. Compere
Oak Ridge National Lab., TN.; Department of Energy, Washington, DC
Filed 12 May 89 15p
PAT-APPL-7-350 816 Available from NTIS: price code A03
It is an object of the present invention to provide an improved means and method for the degradation of hypochlorite in alkali waste solutions. It is a further object of the present invention to provide a more effective and less costly method for the degradation of hypochlorite. The foregoing objects and others are accomplished in accordance with the present invention, generally speaking, by providing a process to degrade hypochlorite into chloride and oxygen which includes contacting an aqueous hypochlorite basic solution with a catalyst comprising about 1--10 w/w % cobalt oxide and about 1--15 w/w % molybdenum oxide on a suitable substrate. In another embodiment a similar process for degrading lithium hypochlorite is provided in which waste solution concentration is lowered in order to minimize carbonate precipitation. 6 tabs.

Process for Single Crystal Growth of High T(Sub C) Superconductors
See 0920

0094 Process of Three Dimensional Lithography in Amorphous Polymers
M. F. Sonnenschein, C. M. Roland
Department of the Navy, Washington, DC
Filed 29 Nov 89 24p
PAT-APPL-7-442 815 Available from NTIS: price code N03

This patent application discloses a process of three dimensional lithography in amorphous polymers to form an instantaneous, permanent image in the polymer by the steps of providing an undoped, non-crystalline layer or film of a polymer having a stable amorphous state under human operating conditions. The film is preferably poly(ethylene terephthalate) (PET), poly(aryl-ether-ether-ketone) (PEEK), poly(chlorotrifluoroethylene) (Kel-F), poly(carbonate) (ie LEXAN 9032), poly(sulfone), poly(methylmethacrylate)(PMMA, or LUCITE), a poly(cyanurate) such as bisphenol A dicyanate, or an epoxy (eg. Epon 820). The film can be either self supporting or mounted on a substrate. The film is then covered (and optionally contacted) with a mask which serves to block the radiation from impinging on where no marking is desired. If the mask is in actual contact with the film, it is capable of also acting as a heat sink. Next, the film is exposed through mask to radiation of sufficient intensity to cause ablation of the exposed areas imparting a distinct, three-dimensional impression in the film. The film may then, for example, be processed by metalization and coating with a protective layer to form a finished product of an optical data storage disk. Keywords: Patent applications; Lithography; Amorphous materials; Polymers; PET; PEEK; LEXAN 9032; PMMA; Lucite; Epon 820; Block the radiation; Heat sink; Ablation Films Coatings, Optical Data Storage Disk, Poly(ethylene terephthalate; Poly(aryl-ether-ether-ketone); Poly(chlorotrifluoro ethylene; Kel-F; Poly(carbonate); Poly(sulfone); Poly(methylmethacrylate); Poly(cyanurate); Bisphenol.

0095 Production of Fructan (Levan) Polyfructose Polymers Using 'Bacillus polymyxa'
Y. W. Han, M. A. Clarke
Department of Agriculture, Washington, DC
Filed 14 Aug 89 23p
PAT-APPL-7-393 604 Available from NTIS: price code N03

Soil isolates, identified as strains of Bacillus polymyxa, NRRL B-18475 and NRRL B-18476, produce large quantities of a pure and uniform extracellular polysaccharide fructan (levan), in a sucrose medium. The levan consists entirely of fructose and the residues linked by Beta,2-6 fructofuranoside linkage.

0096 Selective Metallization of Carbonyl-Containing Polymer Films
C. M. Roland, M. F. Sonnenschein
Department of the Navy, Washington, DC
Filed 29 Mar 90 14p
PAT-APPL-7-500 979 Available from NTIS. price code N03

The present invention relates generally to the metallization of polymers and more specifically to the metallization of carbonyl-containing polymers. It is an object of the present invention to obtain high resolution metallized images on a polymer film. These and other objects are accomplished by contacting a metal film with, or forming a thin layer of metal, a carbonyl-containing polymer substrate. The image is then formed by exposing selected sections of the coated or overlaid substrate to infrared radiation. The spatial distribution of the radiation impinging on the film is controlled either by a mask or by translation of a well-defined beam of infrared light. The metal in the exposed area adheres to the film, while the metal in the non-exposed area may be easily removed. Adhesion of aluminum and copper to the Polyethylene terephthalate (PET) have been found to pass a standard cellophane adhesive tape test. The present invention is particularly suited to the production of microcontacts for printed circuit boards. Patent applications.

Semi-Foamed Polyethylene Molding Tape
See 0588

Sequential Oxidative and Reductive Bleaching in a Multicomponent Single Liquor System
See 0566

Sequential Oxidative and Reductive Bleaching of Pigmented and Unpigmented Fibers
See 0567

Sequential Oxidative and Reductive Bleaching of Pigmented and Unpigmented Fibers
See 0568

0097 Some 1-(Diorganooxyphosphonyl)Methyl-2,4- and -2,6-Dinitro-Benzenes
J. A. Mikroyannidis, D. A. Kourtides
National Aeronautics and Space Administration, Moffett Field, CA. Ames Research Center
Filed 28 May 87, patented 12 Dec 89 7p
PATENT-4 886 896 Available from Comm. of Patents

1-(Diorgano oxyphosphonyl) methyl) 2,4- and 2,6-dinitro- and diamino benzenes are prepared by nitrating an (organophosphonyl)methly benzene to produce the dinitro compounds which are then reduced to the diamino compounds. The organo group (alkyl, haloalkyl, aryl) on the phosphorus may be removed to give the free acids, (HO)2P(double bond O) single bond. The diamino compounds may be polymerized with dianhydrides or diacyl halides to produce fire and flame resistant polymers which are useful in the manufacture of aircraft structures.

0098 Substituted 1,1,1-Triaryl-2,2,2-Trifluoroethanes and Processes for Their Synthesis
W. B. Alston, R. F. Gratz
National Aeronautics and Space Administration, Cleveland, OH. Lewis Research Center
Filed 23 Feb 88, patented 5 Dec 89 12p
PATENT-4 885 116 Available from Comm. of Patents

Synthetic procedures are disclosed for tetraalkyls, tetraacids, and dianhydrides substituted 1,1,1-triaryl 2,2,2-trifluoroethanes which comprises: (1) 1,1-bis (dialkylaryl) 1-aryl 2,2,2-trifluoroethane, (2) 1,1-bis (dicarboxyaryl) 1-aryl 2,2,2-trifluoroethane, or (3) cyclic dianhydride or diamine of 1,1-bis (dialkylaryl) 1-aryl 2,2,2-trifluoroethanes. The synthesis of (1) is accomplished by the condensation reaction of an aryltrifluoromethyl ketone with a dialkylaryl compound. The synthesis of (2) is accomplished by the oxidation of (1). The synthesis dianhydride of (3) is accomplished by the conversion of (2) to its corresponding cyclic dianhydride. The synthesis of the diamine is accomplished by the similar reaction of an aryltrifluoromethyl ketone with aniline or aklyl substituted or disubstituted anilines. Also, other derivatives of the above are formed by nucleophilic displacement reactions.

Sulfur-Containing Xanthine Derivatives as Adenosin Antagonists
See 0676

0099 Synthesis and Polymerization of Dithioether-Linked Phthalonitrile Monomers
T. M. Keller, T. R. Price
Department of the Navy, Washington, DC
Filed 21 Nov 89 23p
PAT-APPL-7-274 216 Available from NTIS: price code N03
It is an object of this invention to replace metals and inorganic semiconductors and conductors with a non-doped conductive organic polymer with substantial structural strength and thermal stability. Other objects of this invention are: to prepare this conductive polymer from an easily processable, low-cost phthalonitrile monomer; to convert this polymer into a highly conductive material by thermal means; to produce a polymer with a predetermined conductivity over a wide range from insulator to semiconductor to conductor by a simple change in the polymerization temperature; to provide a conductive polymer which is environmentally stable; and to provide a conductive polymer for use at elevated temperatures in an oxidizing environment. Dithioether-linked phthalonitrile monomer are prepared by a substitution reaction between 4-nitrophthalonitrile and a dimercaptan and are polymerized to a high-temperature, oxidation-resistant polymer by heating them at a temperature above their melting point. The rate of polymerization is increased by the addition of an amine. Electrical conductivity of the polymer can be increased to the conductor range by heating the polymer above about 400 C. Keywords: Patent applications.

0100 Synthesis of Dimethylmethylene Dinitramine
M. S. Shang, R. R. Oradoff
Department of the Navy, Washington, DC
Filed 1 Jul 82, patented 9 Oct 84 5p
PATENT-4 476 322 Available from Comm. of Patents
This invention relates to propellants and more particularly to energetic nitramine plasticizers for propellants. One object of this invention is to provide an improved process for preparing 2,4-dinitro-2,4-diazapentane. Other objects of this invention are to provide a safer method of preparing 2,4-dinitro-2,4-diazapentane, to provide a more economical method of preparing 2,4-dinitro-2,4-diazapentane, and to provide a large-scale process for preparing 2,4-dinitro-2,4-diazapentane. These and other objects are accomplished by providing a process comprising the following steps in order: 1) adding N,N-dimethylurea in an organic solvent (e.g., methylene chloride) to mixed acid which is maintained at a temperature which is above the freezing point of mixed acid up to 5 C to produce N,N-dimethyl-N,N-dinitrourea and then drowning the mixed acid solution in ice water; 2) using an organic solvent to extract the N,N-dimethyl-N,N-dinitrourea from the mixed acid-water mixture; 3) hydrolyzing the N,N-dimethyl-N,N-dinitrourea to form methylnitramine by adding the N,N-dimethyl-N,N-dinitrourea-organic solvent solution to water which is at a temperature of from 37 C to 100 C; and 4) isolating the product methylnitramine. Keywords: Patents, Evaporation, Reduction chemistry, Addition reactions.

0101 Synthesis of Phthalonitrile Resins Containing Ether and Imide Linkages Specification
T. M. Keller
Department of the Navy, Washington, DC
Filed 16 May 89 29p
PAT-APPL-7-352 327 Available from NTIS: price code N03
This invention relates, in general, to high temperature materials and, in particular, to a new class of aromatic phthalonitrile monomers containing ether and imide linkages and their conversion to high temperature thermosetting polymers and copolymers and the synthesis thereof. Interest in fiber-reinforced composites for advanced aerospace applications has led to the search for high temperature polymers that are easily processed and exhibit high thermal and oxidative stability. Presently, epoxies and polyimides are used. These materials lack the thermal stability to operate at high temperatures and tend to oxidize and become brittle over time. Phthalonitrile polymers constitute a recent and important class of high-temperature materials, having a wide range of uses, such as composite matrices, adhesives, sealants, and even semiconductors. Keywords: Patent applications.

0102 Synthesis of Tetrafluorohydrazine
M. R. Palmer
Department of the Air Force, Washington, DC
Filed 7 Sep 88, patented 23 May 89 4p
PATENT-4 832 931 Available from Comm. of Patents
High purity tetrafluorohydrazine is synthesized by reacting Nitrogen Trifluoride with silicon at an elevated temperature. The reaction occurs only periodically and at a low concentration of NF3. Immediate cooling of the reaction material produces tetrafluorohydrazine and Silicon tetrafluoride. Alkaline hydrolysis removes substantially all impurities. Tetrafluorohydrazine is further recovered by cryogenic trapping from the remaining impurities. Tetrafluorohydrazine is useful as a high energy oxidizer as a rocket propellant. For example, when it reacts with hydrazine a specific impulse of about 300 is possible. This value may be compared with those for reaction of oxygen and hydrazine, for which the calculated specific impulse is 273 sec. and the flame temperature is 3000 K. It will be seen that tetrafluorohydrazine provides almost as high a specific impulse, but it differs from oxygen in being storable in liquid condition at normal temperatures, while liquid oxygen requires low temperatures which bring many problems. Tetrafluorohydrazine can also be reacted with ammonia to provide a source of high energy and high impulse. Thus, tetrafluorohydrazine may be stored in missiles which are ready for immediate launching. The present invention is directed at a single step process that produces tetrafluorohydrazine without these undesirable characteristics. Keywords: Patents.

Temperature Adaptable Textile Fibers and Method of Preparing Same
See 0571

0103 Total Synthesis of Northebaine, Normophine, Noroxymorphone Enantiomers and Derivatives Via N-Nor Intermediates
K. Rice, A. Newman
National Institutes of Health, Bethesda, MD
Filed 26 Oct 89 21p
PAT-APPL-7-421 900 Available from NTIS: price code N03
The invention is a process in which nordihydrocodeinone, an early intermediate in the total synthesis of codeine, morphine and thebaine, is converted through intermediates without substitutents on nitrogen to a number of versatile N-nor intermediates. These compounds can serve as precursors for a number of important drugs (with the natural opiate stereochemistry) currently used in the practice of medicine. The process thus eliminates the need for thebaine for the total synthesis of these drugs. Since nordihydrocodeinone is directly available by the total synthesis as

either the (+)- or (-)-enantiomer, optional access is provided to either the natural or unnatural opiate series. Since the N-nor intermediates can be N-alkylated at any stage to afford a desired N-substituted product, the process is much more versatile than the classical route, and substantially shorter because the N-demethylation sequence is eliminated.

0104 Volatile Divalent Double Metal Alkoxides
A. Purdy
Department of the Navy, Washington, DC
Filed 31 Jul 89 17p
PAT-APPL-7-387 047 Available from NTIS: price code N03
The invention relates to volatile mixed metal alkoxides of the formula M'(X)M(Y)Cu(z) (OR) x+2(y+z) wherein M is selected from the group consisting of Ba, Sr, and Ca, M' is an alkali metal, x= 0-6, y= 0- 4 and z= 1 to 6, and x and y are not 0 at the same time, and R is selected from the group consisting of Cme3, CMe(2)Et, CMeEt(2), CMe(2)Pr, CMeEtPr, CEt(3) or combinations of these substituents. Volatile alkoxides of Y and Cu are known. These volatile alkoxides can be used in a CVD process where stoichiometric quantities of the material are sublimated, transported to a substrate and decomposed to an oxide with or without the presence of oxygen. The oxides are then treated in a known manner to produce the superconducting film. Patent applications.

Water Soluble, Antineoplastic Derivatives of Taxol
See 0681

Wet Spinning of Solid Polyamic Acid Fibers
See 0573

CHEMISTRY: Other

Apparatus and process for the electrolytic reduction of uranium and plutonium oxides
See 0053

Arc-Textured High Emittance Radiator Surfaces
See 0534

Bleaching Lignocellulosic Pulps with Light, Oxygen, Water and Semiconductor Powders
See 0592

0105 Catalyst for Carbon Monoxide Oxidation
B. T. Upchurch, I. M. Miller, D. R. Brown, P. P. Davis, D. R. Schryer
National Aeronautics and Space Administration, Hampton, VA. Langley Research Center
Filed 18 Jan 89 11p
PAT-APPL-7-298 150 Available from NTIS: price code A03
A catalyst is disclosed for the combination of CO and O2 to form CO2, which includes a platinum group metal (e.g., platinum); a reduceble metal oxide having multiple valence states (e.g., SNO2); and a compound which can bind water to its structure (e.g., silica gel). This catalyst is ideally suited for application to high-powered pulsed, CO2 lasers operating in a sealed for closed-cycle condition

0106 Catalyst for Carbon Monoxide Oxidation
B. T. Upchurch, I. M. Miller, D. R. Brown, P. P. Davis, D. R. Schryer
National Aeronautics and Space Administration, Hampton, VA. Langley Research Center
Filed 18 Jan 89, patented 27 Mar 90 5p
PATENT-4 912 082 Available from Comm. of Patents
A catalyst is disclosed for the combination of CO and O2 to form CO2, which includes a platinum group metal (e.g., platinum); a reducable metal oxide having multiple valence states (e.g., SnO2); and a compound which can bind water to its structure (e.g., silica gel). This catalyst is ideally suited for application to high-powered pulsed, CO2 lasers operating in a sealed or closed-cycle condition.

Colloidal polyaniline
See 0068

Colloidal polypyrrole
See 0069

0107 Controlled Method of Reducing Electrophoretic Mobility of Various Substances
J. M. Vanalstine
National Aeronautics and Space Administration, Huntsville, AL. George C. Marshall Space Flight Center
Filed 7 Jul 89 20p
PAT-APPL-7-376 487 Available from NTIS: price code A03
A method of reducing electrophoretic mobility of macromolecules, particles, cells, and the like is provided. The method comprises interacting the particles or cells with a polymer-linked affinity compound composed of: a hydrophilic neutral polymer such as polyethylene glycol, and an affinity component consisting of a hydrophobic compound such as a fatty acid ester, an immunocompound such as an antibody or active fragment thereof or simular macromolecule, or other ligands. The reduction of electrophoretic mobility achieved is directly proportional to the concentration of the polymer-linked affinity compound employed, and the mobility reduction obtainable is up to 100 percent for particular particles and cells. The present invention is advantageous in that analytical electrophoretic separation can not be achieved for macromolecules, particles, and cells whose native surface charge structure had prevented them from being separated by normal electrophoretic means. Depending on the affinity component utilized, separation can be achieved on the basis of specific/irreversible, specific/reversible, semi-specific/reversible, relatively nonspecific/reversible, or relatively nonspecific/irreversible ligand-substance interactions. The present method is also advantageous in that it can be used in a variety of standard laboratory electrophoresis equipment.

Detection of Oxygen in Thin Films
See 0040

Electrochemical Preparation of Silver Oxide Electrodes Having High Thermal Stability
See 0401

Electrochemical Preparation of Silver Oxide Electrodes Having High Thermal Stability
See 0252

0108 Encapsulated Calcium Carbide as a Nitrification Inhibitor
N. K. Banerjee, A. R. Mosier
Department of Agriculture, Washington, DC
Filed 8 Aug 88 20p
PAT-APPL-7-229 386 Available from NTIS: price code N03
In North America, approximately 10 million metric tons of nitrogen fertilizer is used annually. About 10-20% of all fertilizer nitrogen is lost because of denitrification and nitrate leaching. In some circumstances, more than 50% is lost. One way to reduce these losses is by use of a nitrification inhibitor, which limits the rate at which ammonium nitrogen in the soil is oxidized to nitrate. The patent applicate relates to a novel composition that provides controlled release of an effective nitrification inhibitor into the soil.

Energetic Diethers and Process for their Preparation
See 0074

High Density Tape Casting System
See 0487

High Resolution Technique and Instrument for Measuring Lattice Parameters in Single Crystals
See 0905

0109 Isotope Exchange in Oxide-Containing Catalyst
K. G. Brown, B. T. Upchurch, R. V. Hess, I. M. Miller, D. R. Schryer
National Aeronautics and Space Administration, Hampton, VA. Langley Research Center
Filed 15 Jan 88, patented 13 Jun 89 5p
PATENT-4 839 330 Available from Comm. of Patents
A method of exchanging rare-isotope oxygen for common-isotope oxygen in the top several layers of an oxide-containing catalyst is disclosed. A sample of an oxide-containing catalyst is exposed to a flowing stream of reducing gas in an inert carrier gas at a temperature suitable for the removal of the reactive common-isotope oxygen atoms from the surface layer or layers of the catalyst without damaging the catalyst structure. The reduction temperature must be higher than any at which the catalyst will subsequently operate. Sufficient reducing gas is used to allow removal of all the reactive common-isotope oxygen atoms in the top several layers of the catalyst. The catalyst is then reoxidized with the desired rare-isotope oxygen in sufficient quantity to replace all of the common-isotope oxygen that was removed.

Method and apparatus for synthesizing various short chain hydrocarbons
See 0077

0110 Method for Obtaining the Spectra of an Unstable Product
R. A. Johnson
Department of the Army, Washington, DC
Filed 28 Feb 90 6p
PAT-APPL-7-487 512 Available from NTIS: price code N03
This patent application discloses a method of obtaining the spectra of a product wherein the product is passed through a gas chromatograph. In it a stream of helium separates the product into components, with the components then being passed through a spectrometer to obtain the spectra of the components. The components are chilled to a temperature below about minus 10 degrees Celcius and preferably below about minus 20 degrees Celcius to render the components stable and non-volatile. Keywords: Patent applications; Gas chromatography; Spectra.

0111 Method for Selective Separation of Mercury and Silver from Gold Cyanide Solutions by Electrowinning
S. Sheya
Department of the Interior, Washington, DC
Filed 23 Feb 90 12p
PAT-APPL-7-484 089 Available from NTIS: price code N03
The invention provides a method wherein cyanide solutions, resulting from the leaching of gold ores or the stripping of loaded activated carbon that contain gold, mercury, silver and some base metals are subjected to electrowinning in a cell which contains a high surface area cathode that has been previously coated with a uniform, adherent film of mercury. The cathode material, and more specifically the material on the cathode surface, influences electrolytic reduction and is therefore critical to selective electrowinning. A material such as copper or platinum onto which a uniform, adherent mercury coating can be applied makes the most effective separation.

Method of Preparing a Thin Diamond Film
See 0541

0112 Method of Preparing Superconducting 'Orthorhomibic' -Type Compounds in Bulk Using C1-C6 Alkanoic Acid Salts
J. C. Cooper, R. Panayappan, J. T. Guy
Department of the Navy, Washington, DC
Filed 29 Feb 88, patented 13 Feb 90 7p
PATENT-4 900 715 Available from Comm. of Patents
Superconducting compositions of the general formula A(n)Q(m)Cu3O(y) are prepared by wet mixing a combination organic acid salts, inorganic acid salts and oxides of A, Q and Cu, wherein at least one salt is an organic acid salt, drying the mixed salts, and then heating the resultant mixed salts to a temperature between 500 and 950 C. The temperature is maintained for a time sufficient to form a substantially orthorhombic superconducting composition. The method achieves good results with only one heating step. The presence of at least one organic salt causes carbonate and nitrate salts of A, Q and Cu to convert to oxides at temperatures between 300 and 400 C. With lower processing temperatures, semiconductor materials and superconducting materials can be processed together. Keywords: Patents.

0113 Microporous Structure with Layered Interstitial Surface Treatment, and Method and Apparatus for Preparation Thereof
S. L. Koontz
National Aeronautics and Space Administration, Houston, TX. Lyndon B. Johnson Space Center
Filed 31 Oct 89 24p
PAT-APPL-7-429 739 Available from NTIS: price code N03
A microporous structure with layered interstitial surface treatments, and the method and apparatus for its preparation are disclosed. The structure is prepared by sequentially subjecting a uniformly surface treated structure to atomic oxygen treatment to remove an outer layer of surface treatment to a generally uniform depth, and then surface treating the so exposed layer with another surface treating agent. The atomic oxygen/surface treatment steps may optionally be repeated, each successive time to a lesser depth, to produce a microporous structure having multilay-

ered surface treatments. The apparatus employs at least one side arm from a main oxygen-containing chamber. The side arm has characteristic relaxation times such that a uniform atomic oxygen dose rate is delivered to a specimen positioned transversely in the side arm spaced from the main gas chamber.

0114 Microviscometer
J. G. Williams, T. M. Donnellan, R. E. Trabocco
Department of the Navy, Washington, DC
Filed 4 Apr 88, patented 5 Sep 89 6p
PATENT-4 862 735 Available from Comm. of Patents
An apparatus is disclosed for determining the viscosity of fluids and for determining the point of gelation during the curing of a material. Attached to one end of an oscillating lever, a disposable probe is immersed in a small fluid specimen, while a strain gauge and a displacement transducer are attached to the lever for monitoring its movement. The viscosity of fluids is correlated with the strain measurement, while the gelation point of a material during its curing cycle is determined by monitoring the phase angle between the strain gauge output and the lever displacement transducer output. Keywords: Patents, PAT-CL-73-54.

0115 Preparation of Ultra-Pure Metal Halides
P. E. Nordquist, A. H. Singer
Department of the Navy, Washington, DC
Filed 27 Mar 90 15p
PAT-APPL-7-499 843 Available from NTIS: price code N03
Metal halides are ultrapurified by selective complexation with a complexing agent to form a charged first complex. A ligand forms an oppositely charged second complex with metallic impurities in the metal halide to be purified. A solution containing these complexes is then passed through an ion exchange column and the desired purified metal halide collected. The present method is particularly useful in the production of ultrapure metal halides, such as zirconium fluorinate, for metallic glasses. Patent applications.

Process for Crosslinking Methylene-Containing Aromatic Polymers with Ionizing Radiation
See 0092

0116 Process for Making a Noble Metal on Tin Oxide Catalyst
B. T. Upchurch, P. A. Davis, I. M. Miller
National Aeronautics and Space Administration, Hampton, VA. Langley Research Center
Filed 31 Aug 87, patented 8 Aug 89 10p
PATENT-4 855 274 Available from Comm. of Patents
A quantity of reagent grade tin metal or compound, chloride-free, and high-surface-area silica spheres are placed in deionized water, followed by deaerating the mixture by boiling and adding an oxidizing agent, such as nitric acid. The nitric acid oxidizes the tin to metastannic acid which coats the spheres because the acid is absorbed on the substrate. The metastannic acid becomes tin oxide upon drying and calcining. The tin-oxide coated silica spheres are then placed in water and boiled. A chloride-free precious metal compound in aqueous solution is then added to the mixture containing the spheres, and the precious metal compound is reduced to a precious metal by use of a suitable reducing agent such as formic acid. Very beneficial results were obtained using the precious metal compound tetraammine platinum(II) hydroxide.

0117 Pyroelectric Calorimeter
W. Hagins
National Institutes of Health, Bethesda, MD
Filed 2 Feb 89 32p
PAT-APPL-7-305 331 Available from NTIS: price code N03
The invention relates to a method and apparatus useful for determining the heat capacity and heat conductivity of small samples of solids and liquids. In particular, the invention relates to a microcalorimeter having an improved sensitivity and response speed for milligram samples based on the pyroelectric effect.

0118 Reference electrode for strong oxidizing acid solutions
L. P. Ridgon, J. E. Harrar, J. C. Bullock, R. R. McGuire
Lawrence Livermore National Lab., CA.; Department of Energy, Washington, DC
Filed 23 May 89 22p
PAT-APPL-7-355 523 Available from NTIS: price code A03
A reference electrode for the measurement of the oxidation-reduction potentials of solutions is especially suitable for oxidizing solutions such as highly concentrated and fuming nitric acids, and solutions of nitrogen oxides, N(sub 2)O(sub 4) and N(sub 2)N(sub 5), in nitric acids. The reference electrode is fabricated of entirely inert materials, has a half cell of Pt/Ce(IV)/CE(3)/70 wt % HNO(sub 3), and includes a double-junction design with an intermediate solution of 70 wt % HNO(sub 3). The liquid junctions are made from Corning No. 7930 glass for low resistance and negligible solution leakage. 5 figs.

0119 Simple System for Decomposing Atrazine in Wastewater
P. C. Kearney, M. T. Muldoon, C. J. Somich
Agricultural Research Service, Washington, DC
Filed 13 Feb 90 15p
PAT-APPL-7-479 804 Available from NTIS: price code N03
The patent application relates to treatments for the disposal of pesticides in wastewater. More particularly, the invention relates to a method for decomposing 2-chloro-4-(ethylamino)-6-(isopropylamino)-s-triazine, hereinafter referred to as 'atrazine' in wastewater solutions.

0120 Soapfilm Flowmeter Device for Measuring Gas Flow Rates
D. A. Stonestrom
Department of the Interior, Washington, DC
Filed 29 Aug 88, patented 10 Apr 90 5p
PATENT-4 914 955 Available from Comm. of Patents
A device for measuring rates of gases over a wide range of absolute pressures is provided which comprises a soapfilm generating chamber having a magnetically actuated, slidable cup which is used to form a soapfilm at the lower end of a flow metering tube, a flow metering tube having photoelectric or other flow measuring means, and a soapfilm trap with puncturing means which punctures the soapfilm after it has been made to travel the length of the flow metering tube by the flow of gas to be measured. The device of the present invention provides a simple, inexpensive means for measuring gas flow rates over a wide range of gas pressures, and the device can be used conveniently and accurately in taking measurements in a variety of different applications.

Supercritical Fluid Extraction Enhancer
See 0033

Temperature Adaptable Textile Fibers and Method of Preparing Same
See 0571

UV absorption control of thin film growth
See 0545

0121 Volatile Divalent Metal Alkoxides
A. Purdy, A. Berry
Department of the Navy, Washington, DC
Filed 31 Jul 89 19p
PAT-APPL-7-387 048 Available from NTIS: price code A03
This invention relates to volatile divalent metal alkoxides useful for the CVD deposition of metal oxides to a substrate. More particularly, this invention relates to volatile alkoxides of barium, strontium, or calcium used to deposit oxides used to make thin, superconducting copper oxide films. The precursors have the formula M (OR)2, wherein M is selected from the group consisting of Barium, Calcium, and Strontium, and R is selected from the group consisting of unsubstituted alkyl groups of 6 to 13 carbons and halogen substituted alkyl groups of 3 to 4 carbons wherein the halogen is selected from two of the halogen substitutions are fluorine. The secondary or tertiary alkyl groups are preferred and the tertiary alkyl groups are most preferred. Keywords: Chemical vapor deposition, Patent applications.

CIVIL ENGINEERING

Concave Drag Bit Cutter Device and Method
See 0827

0122 Method for Assessment of Corrosion Activity in Reinforced Concrete
D. R. Polly
Department of the Navy, Washington, DC
Filed 10 Feb 89, patented 22 May 90 5p
PATENT-4 927 503 Available from Comm. of Patents
The probe is a nondestructive testing device for locating and measuring corrosion activity in reinforcement concrete structures by direct detection of electrochemical current flow. The device consists of a surface probe valved to present alternative measurement paths when measuring the probe potential with respect to a remote reference electrode, allowing the measurement of IR drops associated with corrosion of reinforcement 'rebar'. By grid surveys of concrete structures, areas suffering internal corrosion (the primary cause of marine concrete deterioration) can be located and the level of corrosion activity determined. PAT-CL-204-153.11.

Method of Enhancing Rock Fragmentation and Extending Drill Bit Life
See 0831

Method of Mapping Underground Mines
See 0833

Microwave Assisted Hard Rock Cutting
See 0835

0123 Polymer Bead Containing Immobilized Metal Extractant
D. Seidel, T. Jeffers
Department of the Interior, Washington, DC
Filed 18 Oct 89 16p
PAT-APPL-7-429 326 Available from NTIS: price code N03
The invention relates to the preparation of beads containing immobilized extractants of either biomass material, organic solvents or mixtures of biomass material and organic solvent materials. These beads are used to effectively remove metal contaminants present in low concentrations from dilute solutions, such as processing streams and waste waters. Removal of the metal values from these extractants is accomplished by using dilute mineral acids or other dilute solutions to solubilize the metal.

0124 Soil Erodibility Testing
G. J. Hanson
Agricultural Research Service, Washington, DC
Filed 11 Apr 90 25p
PAT-APPL-7-507 440 Available from NTIS: price code N03
The present invention is drawn to a highly advantageous and novel apparatus and process with which the aforementioned soil erodibility factor may be determined, for any of a wide variety of soils and under a wide variety of conditions. Said factor may then be utilized in the above equations to predict erosion rate. Measurement of erodibility and prediction of erosion rate are clearly of extensive utility in many engineering applications, such as design and construction of canals, roads, dams, embankments, earth auxiliary spillways, ditches (e.g. roadside ditches), rill erosion determinations, agricultural land management, land reclamation e.g. mining reclamation activities, etc.

COMBUSTION & ENGINES

0125 Automatic Prestart or Post Shutoff Engine Lubricator
J. R. Andres
Department of the Air Force, Washington, DC
Filed 28 Apr 88, patented 2 May 89 9p
PATENT-4 825 826 Available from Comm. of Patents
A system for automatically injecting lubricating oil into the lubricating system of an engine prior to startup of the engine or following shutdown of the engine is described which comprises a solenoid controlled spring loaded piston and cylinder arrangement which is filled with oil under pressure during normal engine operation and a control circuit responsive to the ignition switch of the engine for controlled or metered release of oil from the cylinder either just prior to engine startup or after engine shutdown. PAT-CL-123-196.

0126 Band Clamp Apparatus
D. O. Nash, G. L. Knight, J. H. Bertke
Department of the Air Force, Washington, DC
Filed 24 Feb 88, patented 20 Jun 89 8p
PATENT-4 840 026 Available from Comm. of Patents
A band clamp apparatus having two 180 deg segments which are bolted together at flanges on the horizontal centerline. A substantial portion of each segment has a scalloped band contour for weight reduction. An internal groove in the band clamp which has parallel facing walls which engage the mated flanges of the casings of the engine/exhaust system. Local radial restraints are provided on the engine/exhaust system casings to achieve radial constraint and circumferential positioning of the band clamp apparatus. Keywords: Patents; Clamps; Exhaust nozzles; Engine components; Exhaust systems; Restraint; Weight reduction; Jet engines; Turbine components.

0127 Bypass Electronic Emergency Fuel System
G. Melnik, B. Amrein, R. D. Brucksch, C. L. McCoy, J. A. Martin
Department of the Army, Washington, DC
Filed 1 May 89 14p
PAT-APPL-7-348 752 Available from NTIS: price code N03
This patent application discloses an emergency bypass mechanism to route fuel around an electronically controlled fuel flow regulator of a combat vehicle when flow through the regulator becomes severely restricted. The mechanism includes electrically actuated valves hydraulically in parallel with the regulator, the valves being partly controlled by signals generated during manually shifting of the vehicle's transmission and partly controlled by a system of switches in a control panel. Keywords: Tank engines; Fuel engines; Fuel injection.

Compression Pylon
See 0929

0128 Externally Vaporizing System for Turbine Combustor
C. C. Gleason, E. E. Ekstedt
Department of the Air Force, Washington, DC
Filed 10 Sep 86, patented 13 Jun 89 5p
PATENT-4 838 029 Available from Comm. of Patents
The present invention relates to turbine engines, and, in particular, relates to a combustor therein. The present invention is directed toward providing a combustor in which the undesirable characteristics of prior liquid fuel systems are overcome in light of the advantages of a purely gaseous system. The externally vaporizing system of the present invention incorporates an auxiliary burner which is supplied with compressor discharge air at a rate which is regulated to the main fuel flow rate. The auxiliary burner is operated at approximately stoichiometric fuel-air-ratio, in order to provide very-hot, nearly-inert gases for vaporizing the main fuel supply. The main fuel is sprayed in the auxiliary burner exit gas stream where rapid mixing and evaporation occur. The resulting vaporized fuel/inert gas mixture (at about 800 F., preferably) is then ducted and distributed to the individual main combustor fuel injectors where it is injected into the premixing ducts. Patents.

0129 High-Pressure Promoted Combustion Chamber
M. A. Rucker, J. M. Stoltzfus
National Aeronautics and Space Administration, Houston, TX. Lyndon B. Johnson Space Center
Filed 18 Jul 89 19p
PAT-APPL-7-381 239 Available from NTIS: price code N03
In the preferred embodiment of the promoted combusiton chamber disclosed herein, a thick-walled tubular body that is capable of withstanding extreme pressures is arranged with removable upper and lower end closures to provide access to the chamber for dependently supporting a test sample of a material being evaluated in the chamber. To facilitate the real-time analysis of a test sample, several pressure-tight viewing ports capable of withstanding the simulated environmental conditions are arranged in the walls of the tubular body for observing the test sample during the course of the test. A replaceable heat-resistant tubular member and replaceable flame-resistant internal liners are arranged to be fitted inside of the chamber for protecting the interior wall surfaces of the combustion chamber during the evaluation tests. Inlet and outlet ports are provided for admitting high-pressure gases into the chamber as needed for performing dynamic analyses of the test sample during the course of an evaluation test.

0130 Ignitability Test Method and Apparatus
L. J. Bement, J. W. Bailey, M. L. Schimmel
National Aeronautics and Space Administration, Hampton, VA. Langley Research Center
Filed 25 Oct 89 26p
PAT-APPL-7-426 345 Available from NTIS: price code N03
An apparatus for testing ignitability of an initiator includes a body with a central cavity, initiator holder for holding the initiator over the central cavity of the body, an ignition material holder disposed in the central cavity of the body and a cavity facing the initiator holder which receives a measured quantity of ignition material to be ignited by the initiator and a chamber in communication with the cavity of the ignition material holder and the central cavity of the body. A measuring system for analyzing pressure characteristics is generated by ignition material by the initiator. The measuring system includes at least one transducer coupled to an oscillograph for recording pressure traces generated by ignition.

0131 Lightweight Piston Architecture
A. H. Taylor, P. O. Ransone
National Aeronautics and Space Administration, Hampton, VA. Langley Research Center
Filed 28 Sep 88, patented 20 Mar 90 5p
PATENT-4 909 133 Available from Comm. of Patents
The invention is an improvement in a lightweight carbon-carbon composite piston, the improvement uses near-net shape knitted or warp-interlock preforms to improve the structural qualities of the piston. In its preferred embodiment, a one piece, tubular, closed-ended, knitted preform (a sock) of carbon fibers embedded within the matrix of the piston structure forms the crown, side wall, skirt and inner surface of the piston, and wrap-interlock preforms strengthen the piston crown and wrist pin bosses.

0132 Mixed Flow Swirl Augmentor for Turbofan Engine
T. L. Dubell
Department of the Navy, Washington, DC
Filed 22 Oct 82, patented 24 Jul 84 5p
PATENT-4 461 146 Available from Comm. of Patents
An augmentor in a turbofan jet engine utilized a crossover chute assembly to direct portions of the bypass fan stream inwardly and portions of the hot core stream outwardly into alternating radial zones of fan and core stream flow; and also annularizes a portion of the core stream around those zones. A plurality of angularly positionable radial vanes causes rotational swirl of the radial zones in one direction to produce buoyant g forces that effect rapid inward propagation of a flame front from the annularized zone. Patents.

Nickel Oxide, Ceramic Insulated, High Temperature Coating
See 0542

0133 Sampling apparatus for real-time alkali monitor
W. E. French, R. G. Logan, R. L. Pineault
Department of Energy, Morgantown, WV. Morgantown Energy Technology Center
Filed 27 Feb 89 24p
PAT-APPL-7-315 872 Available from NTIS: price code A03
This report describes a sampling apparatus which provides representatives samples of high-temperature, high-pressure

coal- derived process gases for analysis of alkali concentrations in either a gaseous phase or in a particulate-bearing gaseous phase by a real-time alkali monitor. The apparatus includes a sampling probe in the form of a ceramic tube that is inserted in the stream of combustion products for gathering a representative stream of gaseous products. Critical flow orifices are connected in series between the probe and an alkali monitor burner. A valved vent line connected in-line between the critical flow orifices is used to vent a significant percentage of the flow from the first critical flow orifice device to maintain the upstream pressure required to provide the desired flow rate through the second critical orifice to the alkali monitor burner. The gaseous products in the system between the probe and the burner is heated to inhibit condensation of alkali species. 2 figs.

0134 Steam Cooled Rich-Burn Combustor Liner

D. F. Schultz
National Aeronautics and Space Administration, Cleveland, OH. Lewis Research Center
Filed 23 Dec 82, patented 11 Apr 89 7p
PATENT-4 819 438 Available from Comm. of Patents

Stress on the wall of the primary combustor is minimized. Thus, the steam pressure in the inlet manifold is approximately the same as the combustor discharge pressure at the throat, and annular expansion tubes minimize stresses in the jacket. The second combustor accomplishes lean burning of the gases discharged from primary combustor. The combination of the rich burning of heavy fuels followed by lean burning minimizes the NOx in the exhaust gas discharged from combustor. The novelty of the invention appears to lie in cooling a rich burn combustor with spiral streams of saturated steam flowing between the combustor linear and the jacket at a predetermined pressure; the jacket including stress relief means.

0135 Swirler Assembly for a Vorbix Augmentor

S. J. Markowski, R. S. Reilly
Department of the Navy, Washington, DC
Filed 23 Oct 81, patented 1 May 84 5p
PATENT-4 445 338 Available from Comm. of Patents

An improved swirler assembly prevents flow separation in the diffuser section. An annular swirler layer of air surrounds a linear jet with mixing occurring between these air flows prior to the diffuser section. A center tube through the swirler section provides the linear jet which mixes with the swirler flow in a mixing area prior to the diffuser section.

0136 Turbomachinery Rotor Support with Damping

G. L. Vonpragenau
National Aeronautics and Space Administration, Huntsville, AL. George C. Marshall Space Flight Center
Filed 26 May 89 19p
PAT-APPL-7-364 743 Available from NTIS: price code A03

Damping seals, damping bearings, and a support sleeve are presented for the ball bearings of a high speed rotor. The ball bearings consist of a duplex set having the outer races packaged tightly within the sleeve while the sleeve provides a gap with a support member so that the bearings may float with the sleeve. The sleeve has a web extending radially between the pair of out races and acts in conjunction with one or more springs to apply an axial preload to the outer races. The sleeves have a series of slits which provide the sleeve with a spring-like quality so that the spring acts to center the rotor upon which the bearings are mounted during start up and shut down. A damping seal or a damping bearing may be used in conjunction with the ball bearings and supporting sleeve, the damping seal and damping bearing having rotor portions including rigid outer surfaces mounted within the bore of a stator protion having triangular shaped pockets on the surface facing the rotor. Axial gates are provided between adjacent pockets in sections of the stator permitting fluid to flow with less resistance axially relative to the flow of fluids circumferentially between the rotor and the stator.

0137 Turbomachinery Shaft Insert

G. L. Vonpragenau
National Aeronautics and Space Administration, Huntsville, AL. George C. Marshall Space Flight Center
Filed 26 May 89 12p
PAT-APPL-7-358 028 Available from NTIS: price code A03

An insert is presented for a hollow rotatable shaft on the end of which an impeller is mounted, the insert having a first cylindrical portion receivable within the end of the shaft. The insert includes a radially extending portion adjacent the end of the shaft having an annular wall including radially inner and outer surfaces for engaging tightly similar surfaces in a recess formed in the impeller to provide inner and outer pilot surfaces. The insert also includes a tubular extension which is received within a bore in the impeller, the tubular extension having spaced longitudinally extending slits for permitting the extension together with radially extending hook-like tongues thereon to be received within radial slots in the bore of the impeller to lock the impeller to the insert.

0138 Vibration Analyzer

R. J. Bozeman
National Aeronautics and Space Administration, Houston, TX. Lyndon B. Johnson Space Center
Filed 31 Jan 89 17p
PAT-APPL-7-304 154 Available from NTIS: price code A03

The invention relates to monitoring circuitry for the real time detection of vibrations of a predetermined frequency and which are greater than a predetermined magnitude. The circuitry produces an instability signal in response to such detection. The circuitry is particularly adapted for detecting instabilities in rocket thrusters, but may find application with other machines such as expensive rotating machinery, or turbines. The monitoring circuitry identifies when vibration signals are present having a predetermined frequency of a multi-frequency vibration signal which has an RMS energy level greater than a predetermined magnitude. It generates an instability signal only if such a vibration signal is identified. The circuitry includes a delay circuit which responds with an alarm signal only if the instability signal continues for a predetermined time period. When used with a rocket thruster, the alarm signal may be use to cut off the thruster if such thruster is being used in flight. If the circuitry is monitoring tests of the thruster, it generates signals to change the thruster operation, for example, from pulse mode to continuous firing to determine if the instability of the thruster is sustained once it is detected.

COMMUNICATIONS

0139 Active Phase and Amplitude Modulator
T. E. Olver
Department of the Navy, Washington, DC
Filed 17 Oct 88, patented 29 Aug 89 6p
PATENT-4 862 116 Available from Comm. of Patents
An active phase and amplitude modulator separates an input carrier into four phases. The phases are amplified and modulated separately. Summing circuits combine the phases into a single resultant output. Modulators are an essential part of adaptive signal cancellers. The function of a modulator is to provide a signal matched in amplitude but 180 degrees out of phase with an unwanted signal existing in the canceller circuit. The result is that the unwanted signal is nulled out and cancelled. Unwanted signals may be, for example, signals from a nearby transmitter coupled into the input circuits of a receiver, or distortion causing signals in transmitter circuits. PAT-CL-332-23.R.

0140 Adaptive Polarization Diversity Detection Scheme for Coherent Communications and Interferometric Fiber Sensors
A. D. Kersey, M. J. Marrone, A. Dandrige
Department of the Navy, Washington, DC
Filed 2 Feb 90 32p
PAT-APPL-7-473 807 Available from NTIS: price code N03
Mixing between a reference signal and a data signal is often necessary to extract information from an optical carrier. In communication, the mixing is typically between the received signal and a local oscillator signal at a different frequency. The result is an intermediate frequency (IF) that can be demodulated. In interferometric sensing, the mixing would be between a reference signal and a signal whose phase has been modified by the parameter being measured. The result is an interference signal. In both communication and interferometric sensing, amplitude of the mixed output is dependent upon efficiency of the mixing between the two input optical signals. A method and apparatus for overcoming polarization induced signal fading in both heterodyne communication and interferometric sensing is disclosed. An adjustable birefringent element in series with a linear-polarization beam splitter forms an elliptical-polarization beam splitter. The birefringent element controllably evolves the states of polarization of two input signals thereby controlling the power contribution of each signal onto the orthogonal axes used by the linear beam splitter. When the states of polarization are evolved such that there are equal signals to reference power ratios on the beam splitter axes, subsequent detectors generate a constant, optimum amplitude signal without the need for weighting or decision circuits. Patent applications.

All-Fiber SFPM (Stimulated Four Photon Mixing) Amplifier
See 0302

Apparatus and Method for Minimizing Polarization-Induced Signal Fading in an Interferometric Fiber-Optic Sensor Using Input-Polarization Modulation
See 0187

0141 Apparatus for Generating Enhanced/Regenerative Bracket Decode Signals
P. O. Callahan
Department of the Navy, Washington, DC
Filed 27 Jun 83, patented 10 Feb 87 7p
PATENT-4 642 638 Available from Comm. of Patents
This patent discloses an improved bracket decoder apparatus including a regenerative bracket decoder portion which operates to generate enhanced bracket decode signals and regenerative bracket decode signals. The foregoing combination of decoder portions will allow digital display systems which use IFF information to detect all targets that are replying regardless of the IFF train spacing, even overlapping replies. The enhanced bracket decoder portion of the apparatus can be operated alone to detect all reply conditions except the one of overlapping replies. The apparatus is configured to provide presently used signals also, i.e., the bracket decode, the degarbled bracket decode, and the range and code information for each video reply.

0142 Continuous On-Line Link Error Rate Detector
C. F. Wagner, J. A. Coleman
Department of the Army, Washington, DC
Filed 19 Mar 90 21p
PAT-APPL-7-495 553 Available from NTIS: price code N03
This invention relates generally to communications apparatus and more particularly to apparatus for continuously monitoring, determining and displaying the error rate of a digital communications signal in a multi-channel radio link. Time division multiplex (TDM) multi-channel communication systems or networks are well known. Such systems are particularly useful in digital communication systems utilizing a frame pattern which consists of a plurality of binary signal bits which appear in a continuous data stream. In order to distinguish each frame in the data stream, one bit referred to as the framing bit, typically appears at the end of the frame and exhibits a predetermined same digital pattern unless there are errors in the data stream. Accordingly, the purpose of the framing bit is to provide a marker in the digital stream so that electronic hardware can identify the location of each frame. It is necessary for the communications hardware to know the end of a frame because the data position within the frame must be sorted and transferred to different destinations. Accordingly, it is an object of the present invention to improve the quality, maintainability and operability of time division multiplex communication systems without interruption or interference to the communications channels and without sacrificing channel capacity. Keywords: Patent applications.

0143 Device and Method for Providing Accurate Time and/or Frequency
D. W. Allan, J. Levine, D. D. Davis, M. A. Weiss
National Inst. of Standards and Technology, Gaithersburg, MD
Filed 29 Jan 90 37p
PAT-APPL-7-471 764 Available from NTIS: price code N03
A device and method are disclosed in the patent application for providing an accurate output from a unit, such as an oscillator and/or clock providing an output indicative of frequency and/or time. The device includes a processing section having a microprocessor that develops a model characterizing the performance of the device, including establishing predicted accuracy variations, and the model is then used to correct the unit output. An external reference is used to provide a reference input for updating the model, including updating of predicted variations of the unit, by comparison of the reference input with the unit output. The ability of the model to accurately predict the performance of the unit improves as additional updates are carried out, and this allows the interval between the updates to be length-

ened and/or the overall accuracy of the device to be improved.

0144 Digital Carrier Demodulator Employing Components Working Beyond Normal Limits
W. J. Hurd, R. Sadr
National Aeronautics and Space Administration, Pasadena, CA. Pasadena Office
Filed 12 May 87 10p
PAT-APPL-7-350 813 Available from NTIS: price code A02
In a digital device, having an input comprised of a digital sample stream at a frequency F, a method is disclosed for employing a component designed to work at a frequency less than F. The method, in general, is comprised of the following steps: dividing the digital sample stream into odd and even digital samples streams each at a frequency of F/2; passing one of the digital sample streams through the component designed to work at a frequency less than F where the component responds only to the odd or even digital samples in one of the digital sample streams; delaying the other digital sample streams for the time it takes the digital sample stream to pass through the component; and adding the one digital sample stream after passing through the component with the other delayed digital sample streams. In the specific example, the component is a finite impulse response filter of the order ((N + 1)/2) and the delaying step comprised passing the other digital sample streams through a shift register for a time (in sampling periods) of ((N + 1)/2) + r, where r is a pipline delay through the finite impulse response filter.

0145 Easily Testable High Speed Architecture for Large Rams
N. T. Jarwala, D. K. Pradhan
Department of the Air Force, Washington, DC
Filed 12 Jun 87, patented 23 May 89 9p
PATENT-4 833 677 Available from Comm. of Patents
The RAM is partitioned into modules, each of which appear as the leaf node of a binary interconnect network. This network carries the address/data/control bus which permits the nodes to communicate between themselves and with the outside world. The address, data and control signals are applied to the root node. The most significant address bit is decoded, generating either a left subtree or a right subtree select. The other signals would be buffered and propagated down the tree. The solution process occurs at each level within the bus until finally a single leaf node would be selected. Within the node, then, the internal timing and control unit would access the data requested, sending it up the tree or writing the value on the data bus, into the addressed location. Patents.

Fault Tolerant Hypercube Computer System Architecture
See 0163

Frequency Independent Constant Beamwidth Directional Lens Antenna for Very Wideband and Multi-Channel Electromagnetic Communications
See 0327

0146 High Speed Modem
P. J. Giorgio
Department of the Navy, Washington, DC
Filed 4 May 88, patented 29 Aug 89 14p
PATENT-4 862 456 Available from Comm. of Patents
A multiline modem system provides to a computer connection a plurality of telephone lines for transmitting and receiving digital computer data at throughput rates that exceed those of single line modem systems. The system determines the number of available telephone lines, sequences through a series of telephone re-dials, and acknowledges all connections. When the last connection is verified, the system is on-line and data transfer can begin. The system described uses state-of-the-art components and meets FCC Part 68 requirements for connection to the switched telephone network. PAT-CL-370-118.

0147 High Throughput Data Communication System
P. J. Giorgio
Department of the Navy, Washington, DC
Filed 4 May 88, patented 5 Sep 89 15p
PATENT-4 864 567 Available from Comm. of Patents
A multi-line modem provides a plurality of telephone lines to a computer connect ion for transmitting and receiving digital computer data at throughput rates that exceed those of single line modem systems. The system determines the number of available telephone lines, sequences through a series of telephone re-dials, and acknowledges all connections. When the last connection is verified, the system is on-line and data transfer can begin. The system described uses state-of-the-art components and meets FCC Part 68 requirements for connection to the switched telephone network. Patents.

0148 Laser Communication System With Wide Band Magnetostrictive Modulation
L. T. Kabacoff
Department of the Navy, Washington, DC
Filed 15 Sep 89 14p
PAT-APPL-7-408 377 Available from NTIS: price code N03
A laser beam conducted through an optical fiber cable is phase modulated for communication purposes by a signal encoder operative through a source of current to generate a modulated magnetic field applied to a magnetostrictive sheathing. The magnetostrictive sheathing is annealed and covers a portion of the fiber cable which undergoes dimensional change to effect modulation. Patent applications.

Millimeter-Wave Multiplexers
See 0228

Multi-Stage Noise-Reducing System
See 0230

0149 Optical Shutter Switching Matrix
C. H. Grove
National Aeronautics and Space Administration, Cocoa Beach, FL. John F. Kennedy Space Center
Filed 21 Oct 88, patented 20 Mar 90 12p
PATENT-4 910 396 Available from Comm. of Patents
A switching matrix enables switching of optical signals from any of a plurality of optical input paths to selected optical output paths, without requiring physical reconnecting of the inputs or outputs. Plural broadband optical waveguides are defined preferably in otherwise non-transmissive quartz crystalline wafers, to provide relatively high signal isolation. The wafers are fused to electronic shutter windows situated in an array and discretely operable under processor x-y address control. Optical signals passed through actuated electronic shutter windows are summed in output wafers, having waveguide structure generally reverse to that of the input quartz wafers. Through selected segment actuation, optical signals from selected optical input paths may be transmitted or blocked at the electronically controlled shutter array, for being output on selected optical output paths. Alternatively, fiber optic bundles may replace input or output quartz wafers. The switching matrix is useful as a

switching module which may be variously associated in series and/or parallel connections for obtaining a desired number of switching channels, and required levels of signal separation therewith. Input/output signal characteristics and parameters are maintained by power summation at the outputs with automatic gain control, regardless of the number of paths or the like selectively summed in a given output. Connectors may be used in conjunction with the optical input and output paths, whereby both electrical and optical signals may be switched. Various modules may include converters as built-in features, so as to meet particular applications.

0150 Phase Ambiguity Resolution for Offset Qpsk Modulation Systems
T. M. Nguyen
National Aeronautics and Space Administration, Pasadena, CA. Pasadena Office
Filed 30 Nov 89 35p
PAT-APPL-7-443 539 Available from NTIS: price code N03

A demodulator for Offset Quaternary Phase Shift Keyed (OQPSK) signals modulated with two words resolves eight possible combinations of phase ambiguity which may produce data error by first processing received I(sub R) and Q(sub R) data in an integrated carrier loop/symbol synchronizer using a digital Costas loop with matched filters for correcting four of eight possible phase lock errors, and then the remaining four using a phase ambiguity resolver which detects the words to not only reverse the received I(sub R) and Q(sub R) data channels, but to also invert (complement) the I(sub R) and/or Q(sub R) data, or to at least complement the I(sub R) and Q(sub R) data for systems using nontransparent codes that do not have rotation direction ambiguity.

Saw Slanted Array Correlator (Sac) with Separate Amplitude Compensation Channel
See 0174

Solid State Space Harmonic Amplifier
See 0238

Television Monitor Field Shifter and an Opto-Electronic Method for Obtaining a Stereo Image of Optimal Depth Resolution and Reduced Depth Distortion on a Single Screen
See 0380

0151 Two-Way Optic Communication System for Atmospheric Use
L. Sica
Department of the Navy, Washington, DC
Filed 5 Jan 89, patented 19 Dec 89 14p
PATENT-4 888 816 Available from Comm. of Patents

An improved laser-driven, two-way optic communication system for atmospheric use and enabling communication between remote stations. The system is generally made up of a transmitter-receiver (TR) arrangement at one station and a cooperative transmitter-receiver (CTR) arrangement at another station. The TR arrangement is generally made up of laser source beam means, polarizer means, polarized beam rotator means and appropriate lens means. The CTR arrangement is generally made up of appropriate lens means, beam splitter means and first and second phase conjugate mirror (PCM) means. The PCM means are mounted on piezoelectric means that are selectively dithered so as to enable control of the return signal. The TR means causes propagation of a rotated laser source beam polarization output via atmosphere to the CTR arrangement during system use. The CTR arrangement in response to the received laser beam from the TR provides transmission of combined/reflected and phase conjugated beams that are not subject to atmospheric turbulence so as to provide an enhanced two-way communication link with minimal light leakage between the CTR and TR. Patents.

0152 Vegetable Oil-Based Printing Ink
S. Z. Erhan, M. O. Bagby
Agricultural Research Service, Washington, DC
Filed 3 May 90 26p
PAT-APPL-7-519 197 Available from NTIS: price code N03

In the printing industry, the processes in current use include lithography (52% share of the industry), gravure (18%), flexography (19%), letterpress (5%), and screen printing and other miscellaneous processes (6%). The volume of production represents a substantial consumption of a petroleum-based fraction. The petroleum oil shortage in the mid 1970's stimulated research to find alternatives to mineral oil and other petroleum products in ink formulations. The invention relates to vegetable oil-based inks which do not require petroleum products and which possess the desirable properties for most printing ink applications.

0153 VLSI Single-Chip (255,223) Reed-Solomon Encoder with Interleaver
I. Hsu, L. J. Deutsch, T. Truong, I. S. Reed
National Aeronautics and Space Administration, Pasadena, CA. Pasadena Office
Filed 18 May 88, patented 6 Mar 90 15p
PATENT-4 907 233 Available from Comm. of Patents

The invention relates to a concatenated Reed-Solomon/convolutional encoding system consisting of a Reed-Solomon outer code and a convolutional inner code for downlink telemetry in space missions, and more particularly to a Reed-Solomon encoder with programmable interleaving of the information symbols and code correction symbols to combat error bursts in the Viterbi decoder.

COMPUTERS

0154 Adaptive Associative-Processing Optical Computing Architectures
A. D. Fisher
Department of the Navy, Washington, DC
Filed 29 Jan 86, patented 29 Aug 89 15p
PATENT-4 862 406 Available from Comm. of Patents

Accordingly, one object of the present invention is to provide a novel associative processing module which adapts in real-time as it is exposed to associated information patterns, so, at a later time presentation of one pattern results in recall of the other. Another object of the present invention is to provide a novel associative processing module which adaptively learns in real-time, even while simultaneously recalling associations. Another object of the present invention is to provide novel associative processing modules which may be interconnected and cascaded in order to obtain sophisticated processing capabilities. Pat-CL-364-807.

0155 Analog Hardware for delta-Backpropagation Neural Networks
S. P. Eberhardt
National Aeronautics and Space Administration, Pasadena, CA. Pasadena Office
Filed 29 Sep 89 17p
PAT-APPL-7-414 811 Available from NTIS: price code N03
This is a fully parallel analog back propagation learning processor which comprises a plurality of programmable resistive memory elements serving as synapse connections whose values can be weighted during learning with buffer amplifiers, summing circuits, and sample-and-hold circuits arranged in a plurality of neuron layers in accordance with delta-back propagation algorithms modified so as to control weight changes due to circuit drift.

0156 Balanced Bridge Feedback Control System
B. J. Lurie
National Aeronautics and Space Administration, Pasadena, CA. Pasadena Office
Filed 21 Mar 89, patented 27 Mar 90 14p
PATENT-4 912 386 Available from Comm. of Patents
In a system having a driver, a motor, and a mechanical plant, a multiloop feedback control apparatus for controlling the movement and/or positioning of a mechanical plant, the control apparatus has a first local bridge feedback loop for feeding back a signal representative of a selected ratio of voltage and current at the output driver, and a second bridge feedback loop for feeding back a signal representative of a selected ratio of force and velocity at the output of the motor. The control apparatus may further include an outer loop for feeding back a signal representing the angular velocity and/or position of the mechanical plant.

0157 Bloch-Line Memory Element and RAM Memory
L. J. Schwee
Department of the Navy, Washington, DC
Filed 28 May 87, patented 13 Feb 90 12p
PATENT-4 901 278 Available from Comm. of Patents
The present invention relates to a Bloch-line memory element and a nonvolatile RAM memory using such a Bloch-line memory element. The Bloch-line memory element comprises a planar magnetic memory element having magnetic domains separated by a wall which contains a Bloch-line disposed within the individual memory element. Coincident write lines interact with the magnetic element for writing a Bloch-line to a predetermined area within the memory element. For sensing the presence or absence of a Bloch-line within the predetermined area, one write conductor and a sense line are used for determining the logic state of the particular memory element. A plurality of memory elements are disposed in an address matrix and can be selected for reading from or writing to the particular Bloch-line RAM memory element for determining or writing bits of words. Keywords: Data storage systems; Memory devices; Patents.

0158 Bus Programmable Slave Module
W. A. Hall
National Aeronautics and Space Administration, Houston, TX. Lyndon B. Johnson Space Center
Filed 15 Mar 89 27p
PAT-APPL-7-323 748 Available from NTIS: price code N03
A bus programmable slave module card for use in a computer control system is disclosed which comprises a master computer and one or more slave computer modules interfacing by means of a bus. Each slave module includes its own microprocessor, memory, and control program for acting as a single loop controller. The slave card includes a plurality of memory means (S1, S2...) corresponding to a like plurality of memory devices (C1, C2...) in the master computer, for each slave memory means its own communication lines connectable through the bus with memory communication lines of an associated memory device in the master computer, and a one-way electronic door which is switchable to either a closed condition or a one-way open condition. With the door closed, communication lines between master computer memory (C1, C2...) and slave memory (S1, S2...) are blocked. In the one-way open condition invention, the memory communication lines or each slave memory means (S1, S2...) connect with the memory communication lines of its associated memory device (C1, C2...) in the master computer, and the memory devices (C1, C2...) of the master computer and slave card are electrically parallel such that information seen by the master's memory is also seen by the slave's memory. The slave card is also connectable to a switch for electronically removing the slave microprocessor from the system. With the master computer and the slave card in programming mode relationship, and the slave microprocessor electronically removed from the system, loading a program in the memory devices (C1, C2...) of the master accomplishes a parallel loading into the memory devices (S1, S2...) of the slave.

0159 Computer Access Security Code System
E. R. Collins
National Aeronautics and Space Administration, Pasadena, CA. Pasadena Office
Filed 5 Dec 88 16p
PAT-APPL-7-279 630 Available from NTIS: price code A03
A security code system is disclosed for controlling access to computers and computer controlled entry situations. It is comprised of a plurality of subsets of alpha-numeric characters disposed in random order in matrices of at least two dimensions forming theoretical rectangles, or cubes, such that when access is denied, at least one pair of previously unused character subsets not found in the same row or column of the matrix is chosen at random and transmitted by the computer. The proper response to gain access is transmittal of subsets which complete the rectangle, and/or a parallelpiped whose opposite corners were defined by the first groups of the code. Once used, subsets are not used again to absolutely defeat unauthorized access by eavesdropping, and the like.

0160 Computer Access Security Code System
E. R. Collins
National Aeronautics and Space Administration, Pasadena, CA. Pasadena Office
Filed 5 Dec 88, patented 15 May 90 13p
PATENT-4 926 481 Available from Comm. of Patents
A security code system for controlling access to computer and computer-controlled entry situations comprises a plurality of subsets of alpha-numeric characters disposed in random order in matrices of at least two dimensions forming theoretical rectangles, cubes, etc., such that when access is desired, at least one pair of previously unused character subsets not found in the same row or column of the matrix is chosen at random and transmitted by the computer. The proper response to gain access is transmittal of subsets which complete the rectangle, and/or a parallelepiped whose opposite corners were defined by first groups of code. Once used, subsets are not used again to

absolutely defeat unauthorized access by eavesdropping, and the like.

0161 Discrete Event Simulation Tool for Analysis of Qualitative Models of Continuous Processing Systems
J. T. Malin, B. D. Basham, R. A. Harris
National Aeronautics and Space Administration, Houston, TX. Lyndon B. Johnson Space Center
Filed 14 Jul 88 70p
PAT-APPL-7-219 295 Available from NTIS: price code N03

An artificial intelligence design and qualitative modeling tool is disclosed for creating computer models and simulating continuous activities, functions, and/or behavior using developed discrete event techniques. Conveniently, the tool is organized in four modules: library design module, model construction module, simulation module, and experimentation and analysis. The library design module supports the building of library knowledge including component classes and elements pertinent to a particular domain of continuous activities, functions, and behavior being modeled. The continuous behavior is defined discretely with respect to invocation statements, effect statements, and time delays. The functionality of the components is defined in terms of variable cluster instances, independent processes, and modes, further defined in terms of mode transition processes and mode dependent processes. Model construction utilizes the hierarchy of libraries and connects them with appropriate relations. The simulation executes a specialized initialization routine and executes events in a manner that includes selective inherency of characteristics through a time and event schema until the event queue in the simulator is emptied. The experimentation and analysis module supports analysis through the generation of appropriate log files and graphics developments and includes the ability of log file comparisons.

0162 Dynamic Resource Allocation Scheme for Distributed Heterogeneous Computer Systems
H. T. Liu, J. A. Silvester
National Aeronautics and Space Administration, Pasadena, CA. Pasadena Office
Filed 30 Dec 88 25p
PAT-APPL-7-292 124 Available from NTIS: price code A03

This invention relates to a resource allocation in computer systems, and more particularly, to a method and associated apparatus for shortening response time and improving efficiency of a heterogeneous distributed networked computer system by reallocating the jobs queued up for busy nodes to idle, or less-busy nodes. In accordance with the algorithm (SIDA for short), the load-sharing is initiated by the server device in a manner such that extra overhead is not imposed on the system during heavily-loaded conditions. The algorithm employed in the present invention uses a dual-mode, server-initiated approach. Jobs are transferred from heavily burdened nodes (i.e., over a high threshold limit) to low burdened nodes at the initiation of the receiving node when: (1) a job finishes at a node which is burdened below a pre-established threshold level, or (2) a node is idle for a period of time as established by a wakeup timer at the node. The invention uses a combination of the local queue length and the local service rate ratio at each node as the workload indicator.

Easily Testable High Speed Architecture for Large Rams
See 0145

0163 Fault Tolerant Hypercube Computer System Architecture
H. S. Madan, E. Chow
National Aeronautics and Space Administration, Pasadena, CA. Pasadena Office
Filed 29 Oct 87, patented 19 Sep 89 18p
PATENT-4 868 818 Available from Comm. of Patents

A fault-tolerant multiprocessor computer system of the hypercube type comprising a hierarchy of computers of like kind which can be functionally substituted for one another as necessary is disclosed. Communication between the working nodes is via one communications network while communications between the working nodes and watch dog nodes and load balancing nodes higher in the structure is via another communications network separate from the first. A typical branch of the hierarchy reporting to a master node or host computer comprises, a plurality of first computing nodes; a first network of message conducting paths for interconnecting the first computing nodes as a hypercube. The first network provides a path for message transfer between the first computing nodes; a first watch dog node; and a second network of message connecting paths for connecting the first computing nodes to the first watch dog node independent from the first network, the second network provides an independent path for test message and reconfiguration affecting transfers between the first computing nodes and the first switch watch dog node. There is additionally, a plurality of second computing nodes; a third network of message conducting paths for interconnecting the second computing nodes as a hypercube. The third network provides a path for message transfer between the second computing nodes; a fourth network of message conducting paths for connecting the second computing nodes to the first watch dog node independent from the third network. The fourth network provides an independent path for test message and reconfiguration affecting transfers between the second computing nodes and the first watch dog node; and a first multiplexer disposed between the first watch dog node and the second and fourth networks for allowing the first watch dog node to selectively communicate with individual ones of the computing nodes through the second and fourth networks; as well as, a second watch dog node operably connected to the first multiplexer whereby the second watch dog node can selectively communicate with individual ones of the computing nodes through the second and fourth networks. The branch is completed by a first load balancing node; and a second multiplexer connected between the first load balancing node and the first and second watch dog nodes, allowing the first load balancing node to selectively communicate with the first and second watch dog nodes.

0164 Hidden Fault Bit Apparatus for a Self-Organizing Digital Processor System
M. Frazier
Department of the Air Force, Washington, DC
Filed 21 Oct 85, patented 6 Jun 89 5p
PATENT-4 837 683 Available from Comm. of Patents

This document describes a hidden fault bit apparatus for a self-organizing digital processor system utilizing a single bit of non-volatile memory to store a hidden fault bit in each digital processor unit of the system. The hidden fault bit indicates that the digital processor which contains it, is believed to contain a hidden fault and therefore, should not participate in the self-organization process. Keywords: Patents, PAT-CL-364-200.

High Speed Modem
See 0146

0165 Immediate Write, Read, and Erase Optical Storage Medium and Method of Marking and Erasing
M. F. Sonnenschein, C. M. Ronald
Department of the Navy, Washington, DC
Filed 17 Oct 89 27p
PAT-APPL-7-422 723 Available from NTIS: price code N03
This invention relates to a substantially instantaneously reacting polymeric optical storage medium and the method of marking and erasing the medium. Today, we are in an information age. There is an increasing need to record, modify and manipulate information. The volume of information being processed demands a medium with a large capacity for recording and preserving information. At least two types of medium are needed. One, a medium which will record information permanently providing unlimited playback potential, and the other, a medium which will provide the ability to flexibly record and erase. It is preferred that the write and erase medium make the information instantly available. Keywords: Patent applications.

0166 Input/Output Bus Interface Background of the Invention
V. R. Wiss, T. B. Morrow
Department of the Navy, Washington, DC
Filed 6 Nov 89 12p
PAT-APPL-7-432 288 Available from NTIS: price code N03
This invention relates in general to interfaces for computers and particularly to a means of passively gaining access to signals of an Input/Output bus of a ROLM computer. Several models of ROLM computer systems, particularly models 1666B and 1666D provide tactical data management with many military and scientific applications. Passive testing of certain digital signals generated on the I/O bus is desired to ensure proper performance of the computer hardware and software without interfering with its normal operations. An interface is needed to enable a signal monitoring system to gain access to these signals while maintaining the continuity of the interrupt and data channel control lines. An object of the invention is to minimize the noise introduced on the I/O bus when interfacing with a signal monitoring system. Another object is to provide electrical isolation between the I/O bus and a signal monitoring system. A further object is to eliminate the constant need to enter the computer to remove or insert circuit cards when access to I/O bus signals is desired. Keywords: Patent applications.

Liquid Crystal Fiber Optics Large Screen Display Panel
See 0335

0167 Local Area Network with Fault-Checking, Priorities, and Redundant Backup
S. Morales, G. L. Friedman
National Aeronautics and Space Administration, Pasadena, CA. Pasadena Office
Filed 8 Sep 86, patented 11 Jul 89 16p
PATENT-4 847 837 Available from Comm. of Patents
This invention is a redundant error detecting and correcting local area networked computer system having a plurality of nodes each including a network connector board within the node for connecting to an interfacing transceiver operably attached to a network cable. There is a first network cable disposed along a path to interconnect the nodes. The first network cable includes a plurality of first interfacing transceivers attached thereto. A second network cable is disposed in parallel with the first cable and, in like manner, includes a plurality of second interfacing transceivers attached thereto. There are a plurality of three position switches each having a signal input, three outputs for individual selective connection to the input, and a control input for receiving signals designating which of the outputs is to be connected to the signal input. Each of the switches includes means for designating a response address for responding to addressed signals appearing at the control input and each of the switches further has its signal input connected to a respective one of the input/output lines from the nodes. Also, one of the three outputs is connected to a respective one of the plurality of first interfacing transceivers. There is master switch control means having an output connected to the control inputs of the plurality of three position switches and an input for receiving directive signals for outputting addressed switch position signals to the three position switches as well as monitor and control computer means having a pair of network connector boards therein connected to respective ones of one of the first interfacing transceivers and one of the second interfacing transceivers and an output connected to the input of the master switch means for monitoring the status of the networked computer system by sending messages to the nodes and receiving and verifying messages therefrom and for sending control signals to the master switch to cause the master switch to cause respective ones of the nodes to use a desired one of the first and second cables for transmitting and receiving messages and for disconnecting desired ones of the nodes from both cables.

Long Period Pseudo Random Number Sequence Generator
See 0226

0168 Massively parallel computing system
R. E. Benner, J. L. Gustafson, G. R. Montry
Sandia National Labs., Albuquerque, NM.; Department of Energy, Washington, DC
Filed 1 Mar 89 57p
PAT-APPL-7-317 389 Available from NTIS: price code A04
A parallel computing system and method having improved performance where a program is concurrently run on a plurality of nodes for reducing total processing time, each node having a processor, a memory, and a predetermined number of communication channels connected to the node and independently connected directly to other nodes. The present invention improves performance of the parallel computing system by providing a system which can provide efficient communication between the processors and between the system and input and output devices. A method is also disclosed which can locate defective nodes with the computing system.

Maximum Entropy Deconvolver Circuit Based on Neural Net Principles
See 0227

0169 Method and Electronic 'Neural' Net for Maximum Entropy Solutions of Ill-Posed Problems
C. R. Marrian, M. C. Peckerar
Department of the Navy, Washington, DC
Filed 31 Jan 90 30p
PAT-APPL-7-472 936 Available from NTIS: price code N03

This is a continuation in part of application serial number 07/374,815. A problem is considered ill-posed if there is insufficient information available to achieve a unique solution. In general, a deconvolution problem can be termed ill-posed if there are any singularities in the transfer function or if the observation data to be deconvolved are corrupted by noise. An object of the invention is to provide a neural net circuit which uses a cross entropy regularizer to minimize equation. More broadly, another object is to permit the solution of ill-posed deconvolutions, in particular: To deconvolute data in the presence of noise. To reconstruct a best estimate of such noise. Another object is to use a plurality of such neural nets to perform deconvolutions on data generated by a time varying transfer function, while simultaneously updating the values of the transfer function. In accordance with these and other objects made apparent hereinafter, the invention concerns an adaption of the Tank-Hopfield neural network. Keywords: Patent applications.

0170 Network of Dedicated Processors for Finding Lowest-Cost MAP Path
S. P. Eberhardt
National Aeronautics and Space Administration, Pasadena, CA. Pasadena Office
Filed 26 May 89 12p
PAT-APPL-7-357 759 Available from NTIS: price code A03

A method and associated apparatus are disclosed for finding the lowest cost path of several variable paths. The paths are comprised of a plurality of linked cost-incurring areas existing between an origin point and a destination point. The method comprises the steps of, connecting a plurality of nodes together in the manner of the cost-incurring areas; programming each node to have a cost associated therewith corresponding to one of the cost-incurring areas; injecting a signal into one of the nodes representing the origin point; propagating the signal through the plurality of nodes from inputs to outputs; reducing the signal in magnitude at each node as a function of the respective cost of the node; and, starting at one of the nodes representing the destination point and following a path having the least reduction in magnitude of the signal from node to node back to one of the nodes representing the origin point whereby the lowest cost path from the origin point to the destination point is found.

Optical Arithmetic Logic Using the Modified Signed-Digit Redundant Number Representation
See 0356

Optical Beamformers
See 0359

Optical High-Speed Parallel Backplane
See 0363

0171 Real-Time Simulation Clock
D. R. Bennington, D. J. Crawford
National Aeronautics and Space Administration, Hampton, VA. Langley Research Center
Filed 28 Sep 88, patented 17 Apr 90 12p
PATENT-4 918 652 Available from Comm. of Patents

The invention is a clock for synchronizing operations within a high-speed, distributed data processing network. The clock is actually a distributed system comprising a central clock and multiple site clock interface units (SCIUs) which are connected by means of a fiber optic star network and which operate under control of separate clock software. The presently preferred embodiment is a part of the flight simulation system now in current use at the NASA Langley Research Center.

0172 Reconfigurable N-Dimensional Computer Memory
A. D. Parks, A. P. Shuler
Department of the Navy, Washington, DC
Filed 18 Sep 89 20p
PAT-APPL-7-408 970 Available from NTIS: price code N03

The invention is a computer memory architecture wherein a multiply partitioned N-dimensional memory for serial and parallel computers provides a specialized storage and retrieval media. It can efficiently service associated computational processes with one dimensional hyperplanes of data that are accessible from any of the N-directions in a single access, or fewer accesses than required of conventional computer memory. This architecture reduces access time and complexity in parallel and array processing. Patent applications.

0173 Robotic Vision System
N. M. Witriol, W. H. Brumage, D. H. Cowling
Department of the Navy, Washington, DC
Filed 8 Apr 88, patented 1 Aug 89 9p
PATENT-4 853 771 Available from Comm. of Patents

A Robotic Vision System for real time operation has been developed, based on a luminous fiduciary code located upon a robot and an object the robot is to operate on. The luminescent code, when irradiated, locate the position of the object relative to the robot thus allowing placement of the fiduciary codes, on the object and the robot, into a predetermined desired position and orientation. Keywords: Patent, PAT-CL-358-93.

0174 Saw Slanted Array Correlator (Sac) with Separate Amplitude Compensation Channel
E. A. Mariani, W. J. Skudera
Department of the Army, Washington, DC.; National Aeronautics and Space Administration, Washington, DC
Filed 26 Jun 89 14p
PAT-APPL-7-373 537 Available from NTIS: price code A03

A Surface Acoustic Wave slanted array correlater comprises a piezoelectric substrate, an input and an output interdigital transducer deposited on the piezoelectric substrate, a reflective array aligned with the transducers, and an acoustic absorbing film disposed on the substrate between the output transducer and the reflective array. The input and output transducer are slanted at equal and opposite appropriate angles to each other. The reflective array is disposed on the substrate at an angle the same as the angle of emplacement of the output transducer. The transducers comprise a number of interdigital electrodes with varying periodicity, the periodicity being the same for corresponding portions of the two transducers. The reflective array comprises a number of shorted electrodes having a periodicity corresponding to the periodicity of the output transducer. The acoustic absorbing film has a non-uniform width with selected portions having little or no width.

0175 Selective Multimode/Multiconfigurable Data Acquisition and Reduction Processor System
J. C. Edwards, J. M. Deatherage, J. D. Peterman
Department of the Navy, Washington, DC
Filed 23 Jun 88, patented 6 Mar 90 89p
PATENT-4 907 229 Available from Comm. of Patents

An improved high frequency selective multimode/multiconfigurable data acquisition and reduction processor (DARP) system for analyzing more than one high frequency multibit sample data word stream (SDWSM) input from a digital data source arrangement being evaluated. As the result of this analysis, one or more sample data words of any SDWSM are accepted, time-tagged and stored for further analysis in evaluating the arrangement. The DARP system is generally made up of a host computer (HC), a plurality of trigger elements (TEs) and an asynchronous time-tag generator. Each TE is generally comprised of a master control board a plurality of three trigger boards and a TE memory. The DARP system is advantageously provided with a plurality of five primary modes for each TE as well as various secondary modes therefor. Prior to operating any system TE, the operator of the HC normally sets one or more TEs in a setup mode for preselecting various parameters and secondary modes prior to utilizing one or more TEs in one or more primary modes such as for analyzing a SDWSM input. With the TEs being selectable for at least one primary and different secondary modes, one or more TEs may be configured for independent operation, two TEs for master and slave configurations; or three or more TEs for master, slave and independent where any one TE may only be directly linked to the HC. Patents.

0176 Serial to Parallel Data Conversion Interface Circuit

J. H. Allen
Department of the Navy, Washington, DC
Filed 22 Jun 81, patented 8 May 84 10p
PATENT-4 447 804 Available from Comm. of Patents

A serial to parallel data conversion interface circuit is disclosed for converting a serial word supplied by a head tracker to a parallel word so as to allow for the processing of the parallel word by a microprocessor. The head tracker supplies to the interface circuit a data ready pulse signal. The interface circuit, in response to the data ready pulse signal, supplies a data acknowledge pulse ready signal and a clock signal to the head tracker so as to allow the serial word from the head tracker to be transferred to the interface circuit, which then converts the serial word to a parallel word. An enable pulse signal supplied to the interface circuit effects the transfer of the parallel word from the interface circuit to the microprocessor. A reset pulse from the microprocessor then resets the interface circuit so as to allow for the transfer of another serial word from the head tracker. Patents.

0177 Systolic VLSI Array for Implementing the Kalman Filter Algorithm

J. J. Chang, H. Yeh
National Aeronautics and Space Administration, Pasadena, CA. Pasadena Office
Filed 1 Apr 87, patented 18 Apr 89 12p
PATENT-4 823 299 Available from Comm. of Patents

A method and apparatus for processing signals representative of a complex matrix/vector equation are disclosed and claimed. More particularly, signals representing an orderly sequence of the combined matrix and vector equation, known as a Kalman filter algorithm, is processed in real-time in accordance with the principles of this invention. The Kalman filter algorithm is converted into a Faddeev algorithm, which is a matrix-only algorithm. The Faddeev algorithm is modified to represent both the matrix and vector portions of the Kalman filter algorithm. The modified Faddeev algorithm is embodied into electrical signals which are applied as inputs to a systolic array processor, which performs triangulation and nullification on the input signals, and delivers an output signal to a real-time utilization circuit.

0178 Thin Film Magnetic Memory Elements

G. Z. Prinz
Department of the Navy, Washington, DC.; National Aeronautics and Space Administration, Washington, DC
Filed 1 Jun 89 21p
PAT-APPL-7-360 173 Available from NTIS: price code A03

This invention is directed to a high density magnetic film memory storage device, and more particularly to such a memory storage device wherein the individual storage elements are patterned on a substrate using the intrinsic and structural anisotropies of the particular magnetic film, such that fringing fields about each storage element are eliminated. The first commercial random access nonvolatile magnetic memories were magnetic core systems in which circular magnetic ferrite cores were used as memory elements, were arranged in large three-dimensional arrays, and were coupled to selected wire wraps for reading and writing.

Video Zoom Processor

See 0845

0179 Vlsi Binary Updown Counter

T. Truong, I. Hsu, I. S. Reed
National Aeronautics and Space Administration, Pasadena, CA. Pasadena Office
Filed 13 Jan 88, patented 4 Jul 89 7p
PATENT-4 845 728 Available from Comm. of Patents

A pipeline binary updown counter is comprised of simple stages that may be readily replicated. Each stage is defined by the Boolean logic equation: A(sub n)(t) = A(sub n)(t - 1) exclusive OR (U AND P(sub n)) inclusive OR (D AND Q(sub n)), where A(sub n)(t) denotes the value of the nth bit at time t. The input to the counter has three values represented by two binary signals U and D such that if both are zero, the input is zero, if U = 0 and D = 1, the input is -1 and if U = 1 and D = 0, the input is +1. P(sub n) represents a product of A(sub k)'s for 1 is less than or equal to k is less than or equal to -1, while Q(sub n) represents the product of bar A's for 1 is less than or equal to K is less than or equal to n - 1, where bar A(sub k) is the complement of A(sub k) and P(sub n) and Q(sub n) are expressed as the following two equations: P(sub n) = A(sub n - 1) A(sub n - 2)...A(sub 1) and Q(sub n) = bar A(sub n - 1) bar A(sub n - 2)...bar A(sub 1), which can be written in recursive form as P(sub n) = P(sub n - 1) AND bar A(sub n - 1) and Q(sub n) = Q(sub n - 1) AND bar A(sub n - 1) with the initial values P(sub 1) = 1 and Q(sub 1) = 1.

DETECTION: Acoustic Detection

0180 Acoustic Intensity Probe

K. W. Ng
Department of the Navy, Washington, DC
Filed 13 Nov 89 12p
PAT-APPL-7-436 509 Available from NTIS: price code N03

An acoustic intensity probe was developed to measure waterborne sound intensity levels using a two-hydrophone technique. The technique utilizes the cross-spectral density of signals from multiple closely spaced hydrophones. Planar (2-dimensional) and 3-dimensional arrays of hydrophones with symmetric and asymmetric configurations were

developed to measure the acoustic intensity levels. This acoustic intensity probe combined with the two-hydrophone technique provides specific information revealing the acoustic energy distribution and propagation of noise sources in any acoustic environment. Patent applications.

0181 **Broadband Sonar Signal Processor and Target Recognition System**
W. W. Au, D. W. Martin
Department of the Navy, Washington, DC
Filed 31 Dec 87, patented 11 Jul 89 9p
PATENT-4 847 817 Available from Comm. of Patents
Target discrimination involves processing of sonar echoes in the time-domain and using features of the targets that the human auditory system uses (time separation and amplitude of echo highlights). Known targets are placed in the water and ensonified by multiple broadband transient signals. Echoes from each of the known targets have time-domain feature data extracted and stored to construct a library of known target features. Unknown targets echoes of transmitted multiple broadband transient signal are received and time-domain feature data is extracted from these. A comparison of the unknown target echo features with the known target echo features provides a discrimination of the unknown target echoes. Keywords: Patents.

Means for Improving Turnaround Time Stability for R-C Energy Detectors
See 0262

0182 **Multi-Channel Acoustic Simulator**
M. C. Dilemmo
Department of the Navy, Washington, DC
Filed 19 Jun 89 29p
PAT-APPL-7-367 814 Available from NTIS: price code N03
This invention relates to acoustic simulators for simulating signals provided by hydrophones in multi-transducer sonar sounding systems for laboratory or dockside testing of multi-transducer sonar sounding systems. In particular, the invention relates to a system which electrically replaces the hydrophone of a multi-transducer sonar array sounding system. At present it is very difficult to provide the acoustic signals generated by a large array of hydrophones which accurately represent the ocean bottom and, in real time, apply the signals to an array sounding system for testing the array sounding system. For example, the Sonar Array Sounding System (SASS) currently in operation on board T-AGS 22, 34, 38, and 39 Oceanographic Survey Vessels includes one hundred forty four hydrophones in its receiving array. Thus in order to simulate hydrophone output and test the SASS, one hundred forty four signals must be applied to the SASS during each simulator update. These updates occur on the order of every 2.5 msec and take place for a duration of three to five seconds. Providing this much data to the SASS is a complex operation requiring a very large bandwidth. Keywords: Patent applications.

Noise-Suppressing Hydrophones
See 0916

Optical Beamformers
See 0359

0183 **Overlap Correlator Synthetic Aperture Processor**
E. J. Sullivan, S. Stergiopoulos
Department of the Navy, Washington, DC
Filed 30 Jun 89, patented 22 May 90 10p
PATENT-4 930 111 Available from Comm. of Patents
A means is provided for extending the useful aperture of a multi-hydrophone towed array by using the overlap of the successive positions of the array hydrophones as the array moves forward through the water. The overlap information is used by an overlap correlator to provide phase correction factors for a synthetic aperture signal processing scheme. The overlap correlator continues to refine the correction factors using later in time hydrophone measurement data. Patents.

0184 **Overlap Correlator Synthetic Aperture Processor Statement of Government Interest**
E. J. Sullivan, S. Stergiopoulos
Department of the Navy, Washington, DC
Filed 30 Jun 89 22p
PAT-APPL-7-374 679 Available from NTIS: price code N03
This patent application discloses a means for extending the usefulness of a multihydrophone towed array by using the overlap of the successive positions of the array hydrophones as the array moves forward through the water. The overlap information is used by an overlap correlator to provide phase correction factors for a synthetic aperture signal processing scheme. The overlap correlator continues to refine the correction factors using later in time hydrophone measurement data.

0185 **Pressure Sensitive Optical Fiber Having Optimized Coatings**
N. Lagakos, J. A. Buraro
Department of the Navy, Washington, DC
Filed 18 Oct 89 30p
PAT-APPL-7-423 176 Available from NTIS: price code N03
This invention relates to coatings for optical fibers to maximize their acoustic sensitivity and more particularly to such coatings which are selected from materials having high Young's modulus and/or low bulk modulus. Keywords: Interferometric fiber optical sensors; Pressure changes; Acoustic fields; Magnetic fields; Electric fields; Temperature changes; Detectors; Patent applications; Optical detectors.

0186 **Underwater Object Detection System**
B. S. Maccabee
Department of the Navy, Washington, DC
Filed 7 Nov 89 13p
PAT-APPL-7-447 321 Available from NTIS: price code N03
Propagation of modulated radiation from a platform is substantially limited to unidirectional transmission through a body of water. Acoustical energy is generated at the surface of a remote object submerged in the water in response to impingement and absorption of the modulated radiation from the platform. Radiation of the acoustical energy generated adjacent the object is detected at the platform to extract data therefrom from which the location of the object relative to the platform is indicated. Patent applications.

DETECTION: Optical Detection

Alternating Gradient Photodetector
See 0304

0187 Apparatus and Method for Minimizing Polarization-Induced Signal Fading in an Interferometric Fiber-Optic Sensor Using Input-Polarization Modulation
A. A. Kersey, M. J. Marrone
Department of the Navy, Washington, DC
Filed 21 Jul 89 35p
PAT-APPL-7-838 390 Available from NTIS: price code N03
An apparatus for minimizing polarization-induced signal fading in an interferometric fiber optic sensor is disclosed. The apparatus includes an optical source for providing an input light beam, a polarization modulator for modulating the state of polarization of the input beam into at least three states represented by mutually perpendicular polarization vectors on a Poincare Sphere. The apparatus further includes means for conveying the input light beam with at least three mutually perpendicular modulated states of polarization to the fiber optic sensor, the interferometric fiber optic sensor being responsive to the input light beam with modulated polarization states for developing an interference pattern output, wherein the interference pattern output has at least three visibilities corresponding to the input states of polarization. A photodetector is responsive to the interference pattern output for developing an electrical signal having at least three amplitudes corresponding to the at least three states of polarization. An output circuit is responsive to the electrical photodetector signal for time-sampling the photodetector signal having three amplitudes corresponding to at least three mutually perpendicular input states of polarization and selecting the one having maximum visibility. A method for minimizing polarization-induced signal fading is also disclosed. Patent applications.

Electron Beam Apparatus for Testing Infrared Detectors in a Cryogenically Shielded Environment
See 0321

Field Induced Gap Infrared Detector
See 0326

0188 Infrared Detector Array
T. Chu
Department of the Navy, Washington, DC.; National Aeronautics and Space Administration, Washington, DC
Filed 27 Jun 89 13p
PAT-APPL-7-371 884 Available from NTIS: price code A03
An infrared detector array is constructed by depositing a plurality of non-contiguous strips of infrared radiation responsive, semiconductor material on a base substrate. A contiguous metal semiconductor contact is then overlaid on the plurality of strips thereby forming an individual detector element wherever the metal contact crosses one of the plurality of strips.

Laser Detection and Discrimination System
See 0334

Laterally Stacked Schottky Diodes for Infrared Sensor Applications
See 0283

Long Wavelength Infrared Detector
See 0337

Long Wavelength Infrared Detector with Heterojunction
See 0338

Method of Sensitizing Pb-Salt Epitaxial Films for Schottky Diodes
See 0347

Multi-Color Coincident Infrared Detector Background of the Invention
See 0353

Multiband Photoconductive Detector Based on Layered Semiconductor Quantum Wells
See 0354

Multiple Axis, Fiber Optic Interferometric Seismic Sensor
See 0204

0189 Optical Motion Detector Detecting Visible and Near Infrared Light
H. R. Everett
Department of the Navy, Washington, DC
Filed 31 May 89, patented 20 Feb 90 10p
PATENT-4 902 887 Available from Comm. of Patents
An optical motion detector detects changes in scene lighting indicative of motion and is also capable of detecting surveillance by active night vision devices using near-infrared light. The detector includes two photodetectors which each provide data to a signal processing network. One photodetector is sensitive to visible light; the other to near-infrared light. Both signal processing networks are identical and include a sample-and-hold, a comparator network, and a pulse stretcher. The output of a photodetector is provided to the sample-and-hold and comparator network. The comparator network compares a voltage corresponding to the instantaneously detected ambient lighting scene with a voltage corresponding to a reference lighting scene. The pulse stretcher receives the output of the comparator network and in turn provides an output to a logical processor. The logical processor compares the outputs of both signal processing networks and provides an output indicating surveillance with near-infrared light. The logical processor also indicates any perturbations in intensities of incandescent and fluorescent light. Patents.

Sensitization Pretreatment of Pb-Salt Epitaxial Films for Schottky Diodes by Sulfur Vapor Exposure
See 0371

DETECTION: Radiofrequency Detection

0190 Ablative Cooling of Aerodynamically Heated Radomes
L. H. Schindel, R. T. Driftmyer
Department of the Navy, Washington, DC
Filed 14 Dec 89 15p
PAT-APPL-7-450 754 Available from NTIS: price code N03
This invention relates generally to the cooling of surfaces aerodynamically heated by flow of air relative thereto, and more particularly to the cooling of radiation transmissive nose cone surfaces of missiles having properties adversely affected by aerodynamic heating during air travel at high velocities. A radome type nose cone shell subjected to aerodynamic heating during projectile travel, is ablatively cooled by evaporation of metal coolant from a solidified coating thereof adhering to the external surface of a porous section of the cone shell through which the coolant seeps from internal storage at a rate regulated by formation of the

solidified coating. The evaporating coolant from the coating mixes with the air in the flow stream to form a protective boundary layer extending downstream from the porous section of the nose cone shell. The coolant is melted by said aerodynamic heating during internal storage within the nose cone shell for seepage outflow from the porous section and has the requisite heats of evaporation and fusion to effect alternate freezing and thawing thereof in response to withdrawal of heat by the cooling process for establishment and maintenance of the flow regulating coating. Patent applications.

0191 Adaptive MTI Target Preservation
F. F. Kretschmer, B. L. Lewis
Department of the Navy, Washington, DC
Filed 30 Jan 89, patented 3 Apr 90 10p
PATENT-4 914 442 Available from Comm. of Patents
This patent discloses method of preserving targets in the clear in an adaptive baseband MTI radar system with pulse compression is disclosed. The angle of the weighting signal is determined from the inverse tangent of the inphase and guadrature components of the weighting signal. This angle is then compared to a threshold angle in order to generate a modified weighting signal.

Almond Test Body
See 0303

0192 Automatic Classification of Images
J. A. Knecht, D. L. Chenoweth
Department of the Navy, Washington, DC
Filed 28 Oct 83, patented 14 Nov 89 8p
PATENT-4 881 270 Available from Comm. of Patents
A method and system for classifying a raster scanned target image by collapsing the image into a vector corresponding to a horizontal line of the image, mathematically transforming this vector into a feature vector which corresponds to the power spectrum of the collapsed image, and comparing the feature vector with stored decision rules corresponding to classes of possible target objects to determine if the image represents an object in one of the classes. Patents.

0193 Automatic Thresholding Multichannel Digital Radar Early Warning System
W. P. Huntley
Department of the Navy, Washington, DC
Filed 4 Apr 88, patented 22 Aug 89 6p
PATENT-4 860 013 Available from Comm. of Patents
An RF multiplexer divides an incoming signal from an RF antenna into discrete frequency bands. Each frequency band has its own separate circuit on separate lines to operate on the frequency band and determines if a radar signal is present or if only noise is present on the line. This is done by comparing the incoming signal for magnitude with a DC signal that is generated within the circuit and is proportional to the noise within the frequency band. An indication that any of the signals within the discrete frequency bands exceed the DC signal generated within the same band results in an alarm indication. Patents. PAT-CL-342-20.

0194 Doppler Radar with Multiphase Modulation of Transmitted and Reflected Signal
P. W. Shores, J. W. Griffin, H. S. Kobayashi
National Aeronautics and Space Administration, Houston, TX. Lyndon B. Johnson Space Center
Filed 25 Nov 87, patented 22 Aug 89 16p
PATENT-4 860 014 Available from Comm. of Patents
A microwave radar signal is generated and split by a circulator. A phase shifter introduces a series of phase shifts into a first part of the split signal which is then transmitted by antenna. A like number of phase shifts is introduced by the phase shifter into the return signal from the target. The circulator delivers the phase shifted return signal and the leakage signal from the circulator to a mixer which generates an IF signal output at the Doppler frequency. The IF signal is amplified, filtered, counted per unit of time, and the result displayed to provide indications of target sense and range rate. An oscillator controls rate of phase shift in the transmitted and received radar signals and provides a time base for the counter. The phase shift magnitude increases may be continuous and linear or discrete functions of time.

0195 Efficient Adaptive Filter Bank
B. L. Lewis
Department of the Navy, Washington, DC
Filed 10 Jan 84, patented 24 Mar 87 7p
PATENT-4 652 881 Available from Comm. of Patents
An N-point Fourier transform circuit for a moving target indicator system including a delay circuit with 2N-2 delays, N frequency filters, a processor for forming a main signal and N-1 auxiliary signals via time sample manipulation, a Gram-Schmidt adaptive canceller circuit for decorrelating the N-1 auxiliary signals from the main signal, and a first and second commutating switches. The first switch tracks a given set of N time samples through the delay circuit. The second switch switches the given set of N time samples through a different successive frequency filters of the N frequency filters every transmission. The first switch tracks in synchronism with the second switch and switches to obtain a new given set of N time samples every NT seconds. Radar; PAT-CL-342-160.

0196 Frequency Agile Synthetic Aperture Radar
D. R. Wehner
Department of the Navy, Washington, DC
Filed 1 Feb 88, patented 25 Jul 89 24p
PATENT-4 851 848 Available from Comm. of Patents
A radar transmission, reception and signal processing system generates high resolution synthetic aperture radar ground maps from air or space platforms using waveforms in which frequency is changed pulse-to-pulse. The transmitted radar signal is comprised of a series N bursts with n pulses per burst wherein each of the pulses is a fixed frequency step, delta f either above or below one or the other of the n pulses, i.e., the n pulses comprises an ordered set and further, preferably, wherein the set of n pulses is arranged in time as a random permutation of the ordered set. In each of the k sample gates for each burst the n complex samples of reflectivity are inverse Fourier transformed from frequency domain samples of reflectivity to synthetic range domain profiles to result in an array of aligned range profiles in each of k coarse range delay positions. Azimuth or cross-range processing is accomplished by thetic range cell with a suitable azimuth reference to result in a set of complex numbers that represent complex reflectivity maps of the earth's surface in that coarse range bin. Patents.

0197 Large-Aperture Sparse Array Detector System for Multiple Emitter Location
W. F. Gabriel
Department of the Navy, Washington, DC
Filed 25 Sep 89 13p
PAT-APPL-7-275 873 Available from NTIS: price code N03

A detector beamformer array system having a sparse array and a reference array is described. The reference array is adapted, according to known principles, to have an output response with one main lobe significantly larger than all other side lobes, and with a substantially flat response. Signals received by both arrays are cross-correlated with one another, and only signals sufficiently correlated are annunciated. The resulting adaptive array system has a resolution even better than that of the sparse array's aperture, and with directional sector selectivity corresponding to the angular width of the reference array's mainlobe, providing a system having high resolution and directional selectivity, but with far fewer sensors than with filled arrays used for this purpose. Patent applications.

0198 Method for Eliminating Self-Screening Noise Jamming in Radar Systems
C. B. Clarkson
Department of the Air Force, Washington, DC
Filed 22 Jan 70, patented 25 Jul 89 4p
PATENT-4 851 847 Available from Comm. of Patents
A method for eliminating self-screening noise jamming from the main beam of a radar in order to reveal the skin echoes of aircraft at the same angle, including the aircraft carrying the jammer by using a main antenna and an auxiliary antenna located a short distance apart, delaying the signal from the auxiliary antenna decorrelating the signals and cancelling the jamming signals. Patents.

0199 Method of Detecting Oil Spills at Sea Using a Shipborne Navigational Radar
E. Tennyson
Department of the Interior, Washington, DC
Filed 30 May 89 14p
PAT-APPL-7-358 049 Available from NTIS: price code A03
A method is provided wherein standard shipborne navigational radar is used for the purpose of detecting oil-spills on the sea. A homogenous sea-return image is obtained by selectively reducing the sea-clutter, rain, and haze filters of the radar while selectively increasing the gain of the radar. Because oil-spills on the surface of the water minimize the backscatter of radar waves, the location of an oil-spill may be determined by identifying characteristic distortions in the form of zones of diminished sea-return in the homogenous sea-return image. A moving oil spill may be tracked with repeated observations.

Radar Guidance System
See 0370

0200 Search-Radar Azimuth Correction
A. M. Schneider, D. W. Doherty
Department of the Navy, Washington, DC
Filed 10 Oct 89, patented 29 May 90 9p
PATENT-4 929 952 Available from Comm. of Patents
A system for generating a corrected azimuth signal for a radar system having a radar antenna and a radar display where the radar antenna is mounted on a craft that is subject to motion and that has a stable reference source. A digital computer is connected to the stable reference source of the craft for receiving signals representative of the craft's roll, and representative of the craft's pitch. The digital computer processes the signals representative of roll and pitch utilizing a correction algorithm in order to generate an azimuth correction signal. This azimuth correction signal is combined with the radar azimuth signal by means of the craft's solid state control differential transmitter. The output of the solid state control differential transmitter constitutes a corrected azimuth signal and is furnished to the display of the radar system. The display thus generated by the radar system pursuant to target detection thus accurately represents the true azimuth of the target. Patents.

0201 Three Hundred and Sixty Degree IFF Video Resynchronizer Unit
P. O. Callahan
Department of the Navy, Washington, DC
Filed 28 Jun 82, patented 16 Dec 86 10p
PATENT-4 630 048 Available from Comm. of Patents
A 360 deg IFF video resynchronizer unit for storing pertinent data such as the range, the code, the IFF mode and the azimuth for each reply from associated transponders is disclosed. The 360 deg IFF video resynchronizer unit is also configured for interfacing with one of a plurality of interrogator subsystems associated with a plurality of radar systems having multiple antennas so as to backup any one of the plurality of interrogator subsystems with a single 360 deg IFF video resynchronizer unit. In addition, any number of the plurality of interrogator subsystems can be replaced with a single 360 deg IFF video resynchronizer unit when at least one of the plurality of interrogator subsystems is present. Patents.

Unidirectional Amplitude Sensitive Noise Riding Threshold Circuit
See 0241

DETECTION: Other

Block Patterning of the Metallization of Polyvinylidene Fluoride Transducers
See 0250

0202 Conformal Ground Referenced Self-Integrating Electric Field Sensor
D. E. Voss, L. M. Miner, K. O. Busby
Department of the Air Force, Washington, DC
Filed 23 Dec 87, patented 25 Apr 89 6p
PATENT-4 825 149 Available from Comm. of Patents
An electric field sensor which may be used to detect the electromagnetic pulse (EMP) which accompanies a nuclear explosion, as well as other pulsed electric fields, is disclosed. One embodiment of this sensor has been constructed with an overall dimension of less than 5 cm. In general a sensor can be built to conform to an arbitrarily shaped conducting surface such as an airplane surface. Because of this conformity the sensor does not perturb the electric field being measured. By building the probe so that its RC time constant is much greater than the pulse rise time the probe output voltage is self integrated, and produces an output that is proportional to the signal itself rather than to its derivative. The nondifferentiating or self-integrating feature allows full utilization of the sensor/oscilloscope bandpass. Patents.

0203 Intelligent Security Assessment System
H. R. Everett, G. A. Gillbreath
Department of the Navy, Washington, DC
Filed 27 Jul 88, patented 15 Aug 89 17p
PATENT-4 857 912 Available from Comm. of Patents
An intelligent security assessment system includes a multiplicity of sensors for detecting intrusion into an area. Each of the sensors operates on a different principle to detect intrusion. For example, sound, vibration, infrared, microwave and light level sensors are used. A computing system receives the outputs of each of the sensors and is pro-

grammed to provide an output based upon an algorithm that minimizes the likelihood of a false indication of intrusion by the intrusion sensors. Each sensor has an on and an off state and the computing system assigns a weighting factor for each sensor that is in the on state. The computing system sums the weighting factors and compares this sum to a reference and then provides a further output when the sum exceeds the reference. This computing system output is used to activate an additional intrusion detector such as an ultrasonic detection system and also to activate a video surveillance camera for observance of the area where the intrusion is indicated. Patents; PAT-CL-340-825.3.

Magnetic Amplifier Housing and Detector for an Improved Tamper Alarm System
See 0340

Method and Apparatus to Enhance the Sensitivity of Cylindrical Magnetostrictive Transducer to Magnetic Fields
See 0263

0204 Multiple Axis, Fiber Optic Interferometric Seismic Sensor
S. L. Garrett, D. L. Gardner
Department of the Navy, Washington, DC
Filed 25 Jan 88, patented 16 Jan 90 7p
PATENT-4 893 930 Available from Comm. of Patents
A mechanical vibration transducer includes a seismic mass is supported by a plurality of cylindrical silicone rubber mandrels. Each mandrel is wound with a length or optical fiber which has a reflective end and a transmissive end. A case surrounds the assemblage and is connected to the supports. When the case is displaced, the supports change diameter in response to the relative motion between the seismic mass and the case. This change in diameter is translated to a change in length of the optical fiber. By using the fibers as arms of a michelson interferometer, a sensitive instrument responsive to displacing vibrations is obtained. This instrument is energized entirely by light transmitted through optical fiber waveguides and whose information is transmitted to the observor using only light waves in optical fibers. Keywords: Patents, PAT-CL-356-345.

Optical Fiber for Magnetostrictive Responsive Detection of Magnetic Fields
See 0361

ELECTROTECHNOLOGY: Antennas

0205 Apparatus and Method for Locating the Axis of Symmetry (Center of Circular Cross Section) of Three Dimensional Objects
J. M. Londino
Department of the Navy, Washington, DC
Filed 22 Apr 88, patented 7 Nov 89 8p
PATENT-4 878 296 Available from Comm. of Patents
An apparatus and method for locating the vertical axis of symmetry of a surface of horizontal circular cross-section is disclosed. The apparatus has a plumb structure that establishes a vertical line of sight, and a horizontal translating structure that preselectedly locates the plumb in the two horizontal dimensions. The plumb has at least three arms whose ends are constrained to lie on a circular perimeter which, because the arms are fixed to the plumb, is horizontally disposed. The translating structure and the arms are manipulated so that he end of the arms touch the surface, constraining the line of sight to be colinear with the axis of symmetry. A laser can make the axis visible. The apparatus and method are useable to locate the focal axis and focus of a parabolic antenna. Patents.

0206 Broadband in-Line Amplifier for Submarine Antennas
B. L. Pease, R. J. Phillips, A. R. Susi
Department of the Navy, Washington, DC
Filed 2 Apr 87, patented 26 Jul 88 5p
PATENT-4 760 348 Available from Comm. of Patents
A towable broadband submarine antenna system for deployment in the ocean during operation comprises an antenna element including a metallic termination tip and a length of single conductor buoyant cable. A broadband amplifier connects to the antenna element and provides separate paths for the VLF/LF and the HF/VHF signals with amplification provided only to the HF/VHF signals. The signal from the broadband amplifier is further transmitted on a coaxial cable. Patents.

0207 Dual Band Slotted Microstrip Antenna
M. J. Gegan
Department of the Navy, Washington, DC
Filed 14 Apr 86, patented 8 Sep 87 6p
PATENT-4 692 769 Available from Comm. of Patents
A dual band microstrip antenna including a slotted microstrip radiating parallel to an spaced from a ground plane with dielectric material there between, the slotted microstrip radiating and having a first resonance corresponding to the dominant radiation mode that would occur in an unslotted microstrip and a second resonance created by the slot. The polarizations of the two resonances are perpendicular to each other with the slot resonance being polarized along the centerline of the slot. Patents.

0208 Dual Frequency Launcher for Circularly Polarized Antenna
M. H. Chen
Department of the Navy, Washington, DC
Filed 10 Aug 88, patented 3 Oct 89 4p
PATENT-4 872 211 Available from Comm. of Patents
A dual frequency antenna feed is formed from a central, circular waveguide connected to the flat boundary of circular, disk-shaped resonant cavity. A second circular waveguide is connected one end of a disk-shaped resonant cavity. Energy of one frequency enters and exits the cavity along the common axis of the waveguides. Energy of the second frequency is introduced to the same resonant cavity by way of a plurality of bandpass filters, also connected to the cavity. This energy enters by way of slots in the cylindrical walls of the cavity. The central circular waveguide is propagating at one frequency but cut off at the second frequency. These bandpass filters are at this pass band for the second frequency, but at the rejection band for the first frequency. Therefore, the isolation between these two input ports are obtained. Patents.

0209 Electric Wave Device and Method for Efficient Excitation of a Dielectric Rod
A. D. Krall, J. P. Coughlin
Department of the Navy, Washington, DC
Filed 1 May 86, patented 4 Jul 89 7p
PATENT-4 845 508 Available from Comm. of Patents
An electric wave operating device for efficiently coupling electromagnetic energy from a waveguide into a dielectric element or vice versa. A guide horn portion is chosen for radiating in the primary HE11 mode and designed to have a

predetermined HE11 mode farfield radiation pattern. A dielectric member is securely disposed with one end in the plane of the aperture of the waveguide horn with the dielectric member having a predetermined HE11 mode farfield radiation pattern substantially equal to the farfield radiation pattern of the horn. PAT-CL-343-785.

0210 Focal Plane Antenna Array for Millimeter Waves
W. M. Waters
Department of the Navy, Washington, DC
Filed 29 Jun 89 26p
PAT-APPL-7-372 963 Available from NTIS: price code N03
A millimeter wave imaging system receives millimeter wave radiation and provides video imaging signals based thereon. The system comprises an imaging lens for receiving incoming radiation; a focal plane antenna array disposed at the focal plane of the lens on which radiation received by the lens is focused; and signal processing and display circuitry for processing the output of the antenna array and for producing and displaying corresponding video imaging signals. The focal plane antenna array comprises a planar array of a plurality of conical horns and circular waveguides which, in use, are disposed at the focal plane of the lens; and a stripline detector assembly coupled to the waveguides for detecting the radiation received thereby. The stripline detector assembly comprises a dielectric substrate having a plurality of microstrip conductors embedded therein, each microstrip conductor being coupled to a respective one of the waveguides, and a diode detector being connected to each microstrip conductor. A solid state commutator samples the output of the detectors and provides a resultant video imaging control signal. Patent applications.

Large-Aperture Sparse Array Detector System for Multiple Emitter Location
See 0197

0211 Lightning Protection Apparatus for RF Equipment and the Like
N. W. Feldman, M. L. Shar
Department of the Army, Washington, DC
Filed 30 Oct 89 24p
PAT-APPL-7-428 792 Available from NTIS: price code N03
Lightning protection apparatus for antenna coupled RF equipment is provided. A one quarter wavelength shorting stub bandpass filter shunts the RF equipment. A distributed capacitance, high voltage coaxial capacitor is serially coupled between the equipment and antenna. The shorting stub is tuned to one quarter wavelength of the RF equipment operating frequency. The series capacitor passes frequencies at or above the operating frequency of the RF equipment. Patent applications.

Opto-Electronic Vivaldi Transceiver
See 0365

0212 Stripline Feed for a Microstrip Array of Patch Elements with Teardrop Shaped Probes
J. Huang
National Aeronautics and Space Administration, Pasadena, CA. Pasadena Office
Filed 7 Sep 89 24p
PAT-APPL-7-404 293 Available from NTIS: price code N03
A circularly polarized microstrip array antenna utilizing a honeycomb substrate made of dielectric material to support on one side the microstrip patch elements in an array, and on the other side a stripline circuit for feeding the patch elements in subarray groups of four with angular orientation and phase for producing circularly polarized radiation, preferably at a 0, 90, 180, and 270 degree relationship is described. The probe used for coupling each feed point in the stripline circuit to a microstrip patch element is teardrop shaped in order to introduce capacitance between the coupling probe and the metal sheet of the stripline circuit that serves as an antenna ground plane. The capacitance thus introduced tunes out inductance of the probe. The shape of the teardrop probe is not critical. The probe capacitance required is controlled by the maximum diameter for the teardrop shaped probe, which can be empirically determined for the operating frequency. An aluminum baffle around each subarray blocks out surface wave between subarrays.

ELECTROTECHNOLOGY: Circuits

Adaptive MTI Target Preservation
See 0191

0213 Apparatus for Using a Time Interval Counter to Measure Frequency Stability
C. A. Greenhall
National Aeronautics and Space Administration, Pasadena, CA. Pasadena Office
Filed 21 Apr 88, patented 27 Jun 89 96p
PATENT-4 843 328 Available from Comm. of Patents
An apparatus for measuring the relative stability of two signals is disclosed comprising a means for mixing the two signals down to a beat note sine wave and for producing a beat note square wave whose upcrossings are the same as the sine wave. A source of reference frequency is supplied to a clock divider and interval counter to synchronize them and to generate a picket fence for providing a time reference grid of period shorter than the beat period. An interval counter is employed to make a preliminary measurement between successive upcrossings of the beat note square wave for providing an approximate time interval therebetween as a reference. The beat note square wave and the picket fence are then provided to the interval counter to provide an output consisting of the time difference between the upcrossing of each beat note square wave cycle and the next picket fence pulse such that the counter is ready for each upcrossing and dead time is avoided. A computer containing an algorithm for calculating the exact times of the beat note upcrossings then computes the upcrossing times.

Broadband In-Line Amplifier for Submarine Antennas
See 0206

0214 Built-in-test by signature inspection (BITSI)
G. C. Bergeson, R. A. Morneau
EG and G Idaho, Inc., Idaho Falls.; Department of Energy, Washington, DC
Filed 27 Mar 89 47p
PAT-APPL-7-328 917 Available from NTIS: price code A03
A system and method for fault detection for electronic circuits. A stimulus generator sends a signal to the input of the circuit under test. Signature inspection logic compares the resultant signal from test nodes on the circuit to an expected signal. If the signals do not match, the signature inspection logic sends a signal to the control logic for indication of fault detection in the circuit. A data input multiplexer between the test nodes of the circuit under test and the signature inspection logic can provide for identification of

the specific node at fault by the signature inspection logic. Control logic responsive to the signature inspection logic conveys information about fault detection for use in determining the condition of the circuit. When used in conjunction with a system test controller, the built-in test by signature inspection system and method can be used to poll a plurality of circuits automatically and continuous for faults and record the results of such polling in the system test controller. 10 figs., 3 tabs.

0215 Coupled Strip Line Circuit
R. G. Corzine, J. A. Mosko
Department of the Navy, Washington, DC
Filed 6 Mar 89, patented 13 Feb 90 7p
PATENT-4 901 039 Available from Comm. of Patents
This patent discusses strip line circuit assembly consisting of a first and second strip line each comprised of three dielectric layers having conductor strips on either side of the center layer and ground planes on the outsides of the outer layers which sandwich the center layer except for an open central portion which turns through a 180 deg curved bend. The three layer first and second layer strip lines are separated by the single layer central portion and are sandwiched between three holding plates. The center holding plate has a curved end extension containing axially spaced channels which receive the conductors of the center dielectric layers in contact with the ground planes on the outer surface of each layer. A ground plane cover having spaced conductor channels corresponding to those in the center holding plate end extension is secured to the ends of the two outer holding plates about the bend to enclose the conductors on the outer surface of the center dielectric layer. Patents.

Device and Method for Providing Accurate Time and/or Frequency
See 0143

0216 Digital-to-Composite IFF Video Converter
P. O. Callahan
Department of the Navy, Washington, DC
Filed 28 Jun 82, patented 16 Dec 86 9p
PATENT-4 630 049 Available from Comm. of Patents
A converter, according to the present invention, operates to convert pertinent IFF data which is in a digital format to an IFF composite video format. The converter is configured to interface with conventional plan-position indicators (PPIs) and decoders. Patents.

0217 Digitally Synthesized Audio Frequency Voltage Source
N. Oldham
National Inst. of Standards and Technology, Gaithersburg, MD
Filed 28 Sep 89 16p
PAT-APPL-7-414 213 Available from NTIS: price code N03
The present invention pertains to voltage waveform generation systems and, more particularly, to the digital generation of synthetic alternating current voltage waveforms in the audio frequency range. The invention provides a method and apparatus for accurately generating a digitally synthesized sinusoidal voltage which is started by storing digital values for sine waveforms in a read only memory.

0218 Dual Channel Gated Peak Detector
R. W. Reed
Department of the Navy, Washington, DC
Filed 30 Jul 82, patented 16 Oct 84 10p
PATENT-4 477 779 Available from Comm. of Patents
A dual channel peak detector having an automatic gain control (AGC) circuit maintains an internal replica of a gated input signal waveform at a constant peak level. An rf signal is input to a double balanced mixer to select that portion of the signal within the time interval of interest. A delay and gate generator circuit provides a variable delay from a sync input and generates a variable length gate which gates on the double balance mixer to pass the signal of interest to the remainder of the peak detector circuit. The gated signal is amplified and multiplied by a pseudo dc signal from the AGC circuit. The peak level of the resultant gates signal is detected, The detected peak level is sampled and input to the AGC circuit which computes the AGC circuit output voltage required to maintain a constant detected peak level amplitude. The AGC circuit output voltage is summed with the voltage from a second channel, and is also output as a dB value and a ratio between channels. Keywords: Patents, PAT-CL-328-151.

Efficient Adaptive Filter Bank
See 0195

0219 Electrostatic Dissipative Maintenance Aid Module Container
N. M. Hubbell, S. L. Murdock, E. P. Romano
Department of the Navy, Washington, DC
Filed 21 Apr 89, patented 12 Dec 89 4p
PATENT-4 886 163 Available from Comm. of Patents
A container for holding circuit cards within a plastic, static dissipative enclosure. The container has a handle and is sturdy enough for carrying as a suitcase The design can be varied so that various circuit card sizes and shapes can be accommodated. The container is suitable for stacking with another like container. Detachable slides are affixed to the container for mounting in a cabinet. Patents.

FET Oscillator Having Controllable Reactance Element-Controlled Two Port Feedback Network
See 0277

Fiber Optic Transversal Filter/Variable Delay Line
See 0325

0220 High Current, Very Wide Band Transconductance Amplifier
O. Laug
National Inst. of Standards and Technology, Gaithersburg, MD
Filed 21 Sep 89 20p
PAT-APPL-7-410 387 Available from NTIS: price code N03
The present invention relates to high current transconductance amplifiers that are stable over a very wide bandwidth. The invention overcomes current/frequency limitations by utilizing the inherent tendency for paralleled current mirrors to add currents so that the sum is independent of frequency, thus obviating the need for a single low-resistance high quality current shunt. The input and output of complementary unipolar current-mirror cells are paralleled. Each cell has a fixed current gain determined by the ratio of two resistors. A differential input voltage to current circuit drives the cell array. The design has the advantage of avoiding the need for a single low resistance current sensing resistor and the attendant problems inherent in such resistors. The invention includes a modification of the basic idea of using complementary current sources or current mirrors with an operational amplifier to obtain a bipolar voltage controlled current source.

0221 High Frequency, Frequency Multiplier Using Parallel Gunn Diodes
M. Ancona
Department of the Navy, Washington, DC
Filed 30 Mar 90 22p
PAT-APPL-7-501 571 Available from NTIS: price code N03
An object of this invention is to increase the frequency of a Gunn effect oscillator by at least an integer factor. In its broadest form, the invention is a Gunn-effect frequency multiplier having a plurality of semiconducting elements capable of supporting Gunn-effect domains; a cathode and an anode, common to all said semiconducting elements, connecting said elements in parallel; and means for sequentially creating a dipole domain in each of said semiconducting elements during a time substantially less than or equal to the shortest transit time of a dipole domain between said anode for any of said semiconducting elements. Patent application.

0222 High Power, Solid State RF Pulse Generators
L. J. Bovino, M. Weiner, A. H. Kim
Department of the Army, Washington, DC.; National Aeronautics and Space Administration, Washington, DC
Filed 12 Jun 89 30p
PAT-APPL-7-374 122 Available from NTIS: price code A03
A high power, solid state burst generator for producing RF pulses includes a plurality of transmission lines, such as coaxial cables, having one end connected across a load via a plurality of photoconductive switches, one for each line. The other end of the transmission lines are terminated in open ends and connected to a charging DC voltage. One set of lines is connected to a positive DC voltage +V while the other set is connected to a negative DC voltage -V. A laser is coupled to one end of a plurality of fiber optic lines, each having a different length, for simultaneously launching switch pulses thereon. The other ends of the fiber optic lines are each coupled to a different one of the photoconductive switches for closing and opening the switches in a sequential fashion such that the lines are sequentially discharged through the load to generate a cyclic series of pulses.

0223 High Resolution, Wide Band Chirp-Z Signal Analyzer
W. J. Skudera, C. E. Konig
Department of the Army, Washington, DC
Filed 25 Sep 89 14p
PAT-APPL-7-411 752 Available from NTIS: price code N03
Wide band and narrow band Chirp-Z channels are interfaced to enhance signal analysis resolution for the signal's individual component waveforms over a wide signal bandwidth. The frequency characteristic of a selected component waveform is matched to the sweeping local oscillator and filter frequency parameters of the narrow band channel in accordance with the relative position occupied by the frequency characteristic of the selected component waveform in the frequency segregated time domain of said wide band channel. In one preferred embodiment, a mixer and a voltage controlled oscillator are utilized to accomplish the frequency matching and in another embodiment, a band-pass filter precisely defines the bandwidth of the selected component waveform. For still another embodiment, the voltage input to the voltage control oscillator is controlled in accordance with the difference in frequency between the selected component waveform and said narrow band channel. Patent applications.

0224 Hold Down Interconnection Stick
L. Dzwonczyk
Department of the Navy, Washington, DC
Filed 2 Apr 90 8p
PAT-APPL-7-502 969 Available from NTIS: price code N03
A hold down interconnection stick is provided which is fastened to the outer walls of a container of an electronic system and to the electronic printed circuit boards which form a part of the electronic system. The stick is also provided with heat dissipating means to carry away the heat generated during the operation of the electronic system so as to enable the electronic components function within their tolerances of temperature. The fastening means provide a vibration-free system and thus reduces any vibration-induced noise. Patent applications.

Image Preprocessing by Modified Median Filter
See 0842

0225 Logic Level Data Conversion System
D. H. Nhu
Department of the Navy, Washington, DC
Filed 23 Feb 90 14p
PAT-APPL-7-483 688 Available from NTIS: price code N03
Interfacing of different logic level devices is effected through a multi-logic level converter under selective control of an assembly of coupler connectors enabling different logic level voltage conversions and operational monitoring of the converter. Patent applications.

0226 Long Period Pseudo Random Number Sequence Generator
C. C. Wang
National Aeronautics and Space Administration, Pasadena, CA. Pasadena Office
Filed 29 Oct 87, patented 26 Dec 89 11p
PATENT-4 890 252 Available from Comm. of Patents
A circuit is described for generating a sequence of pseudo random numbers, (A sub K). There is an exponentiator in GF(2 sup m) for the normal basis representation of elements in a finite field GF(2 sup m) each represented by m binary digits and having two inputs and an output from which the sequence (A sub K). Of pseudo random numbers is taken. One of the two inputs is connected to receive the outputs (E sub K) of maximal length shift register of n stages. There is a switch having a pair of inputs and an output. The switch outputs is connected to the other of the two inputs of the exponentiator. One of the switch inputs is connected for initially receiving a primitive element (A sub O) in GF(2 sup m). Finally, there is a delay circuit having an input and an output. The delay circuit output is connected to the other of the switch inputs and the delay circuit input is connected to the output of the exponentiator. Whereby after the exponentiator initially receives the primitive element (A sub O) in GF(2 sup m) through the switch, the switch can be switched to cause the exponentiator to receive as its input a delayed output A(K-1) from the exponentiator thereby generating (A sub K) continuously at the output of the exponentiator. The exponentiator in GF(2 sup m) is novel and comprises a cyclic-shift circuit; a Massey-Omura multiplier; and, a control logic circuit all operably connected together to perform the function U(sub i) = 92(sup i) (for n(sub i) = 1 or 1 (for n

0227 Maximum Entropy Deconvolver Circuit Based on Neural Net Principles
M. C. Peckerar, C. R. Marrian
Department of the Navy, Washington, DC
Filed 15 Jan 88, patented 18 Jul 89 8p
PATENT-4 849 925 Available from Comm. of Patents
Disclosed are two modifications of the Tank-Hopfield circuit, each of which enables the deconvolution of a signal in the presence of noise. In each embodiment, the Tank-Hopfield circuit is modified so that the equation for total circuit energy reduces to one term representing convolution and another information theoretic (or Shannon) entropy. Thus, in finding its global minimum energy state, each modified circuit inherently identifies an optimal estimate of a deconvoluted input signal without noise. Patents.

0228 Millimeter-Wave Multiplexers
D. Rubin, K. Reinke
Department of the Navy, Washington, DC
Filed 29 Mar 88, patented 20 Feb 90 6p
PATENT-4 902 992 Available from Comm. of Patents
A planar millimeter wave circuit for splitting a very wide input frequency band into three or more lesser bands utilizes bandpass filters exclusively. A triplexer is made by connecting the bandpass filters with coupled line equivalents fed by a conductor with a characteristic impedance the same as the input conductor to the filters and of an appropriate length so as to make the diplexer appear open or nearly open circuited over the adjacent frequency range of a third bandpass filter used in the triplexer or, alternatively, over the adjacent frequency range of a second diplexer connected so as to form a quadruplexer. US-PAT-333/126.

0229 Millimeter Wave Printed Circuit Mixer
J. Reindel
Department of the Navy, Washington, DC
Filed 29 Jul 81, patented 20 Sep 83 6p
PATENT-4 406 020 Available from Comm. of Patents
A millimeter wave printed circuit mixer is disclosed which has extended RF and IF bandwidths. A dual ridge waveguide to slotline transition is utilizing to bring the RF signal into the device. The waveguide to slotline transition is terminated in first and second shorted RF slotlines formed on the bottom of a dielectric substrate and extending from the RF slotline. A microstrip LO bandpass filter terminating in a microstrip line is formed on the dielectric substrate and is utilized to bring the local oscillator signal to the device. First and second beam lead diodes are connected from the microstrip line through apertures in the dielectric substrate and thence are connected across the dual shorted RF slotlines and connected to the ground plane conductor on the underside of the dielectric substrate. An IF filter is formed on the dielectric substrate and connected to the microstrip line for removing the IF signal from the device. The dielectric substrate and the elements formed on the substrate are enclosed within a guideline housing. Patents.

0230 Multi-Stage Noise-Reducing System
H. B. Miller
Department of the Navy, Washington, DC.; National Aeronautics and Space Administration, Washington, DC
Filed 20 Mar 89 29p
PAT-APPL-7-328 651
An electronic noise-reducing system is disclosed which includes a plurality of adaptive filters forming multiple stages of noise reduction and producing a greatly increased signal-to-noise ratio. The input for the primary channel of the first adaptive filter, which forms the first noise-reducing stage, is the signal including multitones buried in noise. The reference channel ideally uses signal-free noise as input. The output of the first adaptive filter is used as the input to the primary channel of the second or final adaptive filter, whereas the reference channel thereof is fed with clean noise. The clean noise can be obtained as the output of the intermediate adaptive filter by feeding simultaneously both the primary and reference channels of the intermediate filter with the noise-reduced waveform present at the output of the first noise-reducing filter.

Niobium and Niobium Nitride Contacts on Semiconducting Material
See 0290

0231 Non-Contacting Printed Circuit Waveguide Elements
J. Reindel
Department of the Navy, Washington, DC
Filed 13 Apr 88, patented 30 Jan 90 8p
PATENT-4 897 623 Available from Comm. of Patents
Arrays of printed circuit elements are placed in the E-plane inside waveguides to reflect and pass selected bands of frequencies. The elements make no contact with the guide walls but are suspended on dielectric substrates and are held in place with foam dielectric. Patents.

0232 Printed Circuit Waveguide to Microstrip Transition
D. L. Saul
Department of the Navy, Washington, DC
Filed 7 May 79, patented 7 Apr 81 6p
PATENT-4 260 946 Available from Comm. of Patents
A waveguide to microstrip transition for transferring guided electromagnetic signals from dominant mode rectangular waveguide to microstrip line and vice versa. A microstrip printed circuit card is disposed in parallel to the narrow walls of a waveguide. The printed circuit card includes a microstrip stepped transformer section followed by a linear taper crossover section. The linear taper crossover section leads into a microstrip line conductor and ground plane for completing the transition. Patents.

0233 Pulsed Interference Canceler of High Power Out-of-Band Pulse Interference Signals
S. K. Miyashiro, F. E. Morris, A. T. Roome
Department of the Navy, Washington, DC
Filed 8 Jun 89, patented 5 Jun 90 1p
PATENT-4 932 039 Available from Comm. of Patents
A pulse interference canceler cancels pulse interference signals by normalizing the signals and comparing in time the normalized signals to each other. An overlap of the normalized signals indicates that both channels of the pulse receiver received transmissions simultaneously or near simultaneously, thereby indicating interfering signals. Detection of the simultaneous or near simultaneous normalized pulses generates a blanking pulse that suppresses any output pulses corresponding to the received interfering signals. Patents.

0234 Real-Time Rejection Circuit to Automatically Reject Multiple Interfering Hopping Signals While Passing a Lower Level Desired Signal
W. J. Skudera, S. D. Albert
Department of the Army, Washington, DC
Filed 8 Jan 90 24p
PAT-APPL-7-461 943 Available from NTIS: price code N03
A real-time rejection circuit is disclosed for passing low level desired signals in the presence of one or more strong,

interfering signals. A chirp-z transform system separates the various frequency components of a received signal into frequency segregated time domain signals. A power splitter separates the time domain signal into two paths. One path includes a modulator or switch that is normally biased ON for passing the time domain signal. The second path includes a diode detector that produces pulses of sufficient strength when a strong interfering component is present to override the bias and turn the modulator OFF for a sufficient period of time to attenuate the unwanted frequency components in the other path. The modulator output will primarily contain the low level desired frequency components that are passed through an inverse transform device for producing a frequency domain signal of the desired signal uncorrupted by unwanted signals. Patent applications.

0235 Reflection Oscillators Employing Series Resonant Crystals'

L. L. Kleinberg
National Aeronautics and Space Administration, Greenbelt, MD. Goddard Space Flight Center
Filed 30 Dec 88, patented 10 Oct 89 7p
PATENT-4 873 498 Available from Comm. of Patents

A reflection oscillator is provided which employs an active device operated in its roll-off region and two resonant circuits. For an oscillator employing a bipolar transistor, the emitter is connected to a series resonant capacitor-crystal network and the base is connected to an L-C tank circuit with the transistor being operated in the roll-off region of its gain versus frequency curve. This will provide a very high frequency of operation with a relatively inexpensive, low frequency, active device. These oscillators are easily tuned, stable, and require little dc power.

0236 RF Phase Shifter

F. J. Elmer, K. S. Kunz, S. J. Jang
Department of the Army, Washington, DC
Filed 23 Oct 89 20p
PAT-APPL-7-425 549 Available from NTIS: price code N03

This patent application discloses an electrically controlled RF phase shifter having an active medium formed from a ceramic material, the permittivity of which may be varied by varying the strength of an electric field in which it is immersed. The phase shifter includes the ceramic material having electrodes mounted thereon that are connected to an adjustable d-c voltage source. The phase shifter may be placed in an RF transmission line that includes appropriate input and output impedance matching devices such as quarter-wave transformers. The phase of the RF power exiting the phase shifter will depend on the effective electrical length of the material in the active medium. Because changes in the permittivity of the material will produce corresponding changes in the electrical length of the material, changes in the phase of the RF power transmitted therein will be produced. The quarter-wave transformers may also be made of a similar adjustable permittivity material. Control voltages applied to the transformers are used to adjust the amount of output power. An interdigitated electrode is used to reduce the amount of voltage needed to operate the phase shifter. The phase shifter may be embedded as part of a microwave integrated circuit.

0237 Single-Side Connected Transducer

W. R. Scott
Department of the Navy, Washington, DC
Filed 6 Jul 82, patented 4 Sep 84 5p
PATENT-4 469 976 Available from Comm. of Patents

A transducer is provided having interconnections between a conductive member and one side of a heat sensitive piezoelectric substrate such as PVF2 to or from which electric signals flow. The interconnections are positioned on one side of the substrate with the opposite side having a metalization under the interconnection attachment positions and in a continuous region there between. The interconnection includes adhesive material such as epoxy disposed between and attaching an electrically conductive member to one side of the substrate and a single contiguous electrically conductive coating applied to adjacent portions of these two members to electrically connect them. Since both interconnections are positioned on one side of the substrate the transducer is adhesively fastenable to operational structure with a strong bond line, permits lead attachment after mounting and prevents lead shortout. Various electrode shapes, sizes and patterns may be constructed to allow power channeling and to produce focusing of the transducer signal. Patents.

0238 Solid State Space Harmonic Amplifier

C. M. Krowne
Department of the Navy, Washington, DC
Filed 1 Mar 88, patented 12 Dec 89 10p
PATENT-4 887 049 Available from Comm. of Patents

A fully monolithic solid state device compatible with standard semiconductor processing for amplifying radio frequency (RF) microwave and/or millimeter wave signals is disclosed. The device includes an input microstrip transmission line which capacitively couples an input RF signal to input underlying grating fingers which, in turn, mode-couple the signal to an interaction grating region by way of an input finger taper region. The RF is amplified in the interaction grating region through its interaction with a space charge wave. Then the amplified RF signal is mode-coupled to output underlying grating fingers by way of an output finger taper region before it is capacitively coupled to an output microstrip transmission line. Patents.

0239 Surface mount component jig

J. W. Kronberg
Du Pont de Nemours (E.I.) and Co., Aiken, SC. Savannah River Plant ; Department of Energy, Washington, DC
Filed 2 May 89 13p
PAT-APPL-7-346 761 Available from NTIS: price code A03

This paper is a patent application for a surface mounted components jig to bend pins of dual-in-line-packages (DIPs) in the manufacture of electronic circuit boards. The patent allows for so bending the pins to compensate for springback and to cut off excess pin length. 9 figs.

0240 Temperature Compensated Crystal Oscillator (TCXO) with Improved Temperature Compensation

J. A. Kosinski
Department of the Army, Washington, DC
Filed 4 Oct 89 11p
PAT-APPL-7-417 132 Available from NTIS: price code N03

A TCXO including a series capacitance is improved by having the temperature sensitivity of the series load capacitance be chosen in accordance with the formula T sub CL = T sub Co + 2 T sub K/(1-alpha sub 0) wherein T sub

CL is the temperature coefficient of the series load capacitor, T sub Co is the temperature coefficient of the resonator static capacitance, TK is the temperature coefficient of the piezoelectric coupling for the resonator, and alpha sub 0 is the center value of load factor alpha wherein the load factor, alpha, is defined as alpha = sub Co sub Co + sub CL wherein sub Co is the resonator static capacitance and sub CL is the series load capacitance. Patent applications.

Ultra-Low-Loss Superconducting Strip-Type Transmission Lines, Circuits, and Resonators
See 0383

0241 Unidirectional Amplitude Sensitive Noise Riding Threshold Circuit
W. P. Huntley
Department of the Navy, Washington, DC
Filed 30 Jun 89, patented 24 Apr 90 6p
PATENT-4 920 346 Available from Comm. of Patents
An RF multiplexer divides an incoming signal from an RF antenna into discrete frequency bands. Each frequency band has its own separate circuit on separate lines to operate on the frequency band and determine if a radar signal is present or if only noise is present on the line. This is done by comparing the incoming signal for magnitude with a DC signal that is generated within the circuit and is proportional to the noise within the frequency band. An indication that any of the signals within the discrete frequency bands exceed the DC signal generated within the same band results in an alarm indication. Keywords: Patents, PAT-CL-342-91.

0242 Yoked Orthogonally Distributed Equal Reactance Non-Coplanar Traveling Wave Amplifier
M. N. Yoder, M. A. Morgan
Department of the Navy, Washington, DC
Filed 27 Aug 87, patented 3 Apr 90 8p
PATENT-4 914 743 Available from Comm. of Patents
This patent discloses a Field Effect Transistor (FET) device especially useful in common gate amplifiers of signals in the microwave to millimeter range. The device's input and output are impedance matched to preclude phase cancellation and form a traveling wave amplifier capable of high voltage operation. The channel is formed of gallium arsenide separated from the gate by a layer of aluminum arsenide heteroepitaxial with gallium arsenide layer. The channel is bounded by heavily doped regions which act as inherent sources and drains, and limit electric field strength to avoid sluggish response of heavy mass carriers. The gates are formed by etching trenches in a semi-insulating gallium arsenide layer on the opposite side of the aluminum arsenide layer from the channel using the aluminum arsenide as an etch stop, oxidizing the exposed aluminum arsenide, and epitaxially growing gallium arsenide to narrow the trench. The resulting gate is disposed on opposite side of the channel from the source and drain contacts thus significantly improving gate-drain breakdown voltage.

ELECTROTECHNOLOGY: Electromechanical Devices

0243 Digitally Controlled System for Effecting and Presenting a Selected Electrical Resistance
J. C. Fletcher, W. L. Ross
National Aeronautics and Space Administration, Huntsville, AL. George C. Marshall Space Flight Center
Filed 15 Jul 87, patented 18 Jul 89 8p
PATENT-4 849 903 Available from Comm. of Patents
A digitally controlled resistance generator is described, in which resistors having values selected according to an expression 2(sup N-1)(R), where N is equal to the number of terms in the expression, and R is equal to the lowest value of resistance, are electrically inserted into a resistive circuit in accordance with a parallel binary signal provided by an analog-to-digital converter or a programmable computer. This binary signal is coupled via optical isolators which, when activated by a logical 1, provides a negative potential to some or all of the gate inputs of the normally on field effect transistors which, when on, shorts out the associated resistor. This applied negative potential turns the field effect transistors off and electrically inserts the resistor coupled between the source terminal and the drain terminal of that field effect transistor into the resistive circuit between the terminals.

0244 Elastomeric Electrical Isolation Membrane
V. J. Marolda
Department of the Navy, Washington, DC
Filed 20 Sep 88, patented 17 Oct 89 5p
PATENT-4 874 326 Available from Comm. of Patents
This document describes a plug-receptacle type electrical connector in combination with a thin, circular, elastomeric membrane joining a plurality of cylindrical elastomeric embossment formed as an integral part thereof. Each embossment further has conical ends at each extremity and an outside diameter slightly larger than the receptacle socket cavity it will contact. Each embossment also has a longitudinal through-hole of inside diameter (ID) slightly smaller than the electrical connector plug pin it is intended to fit over. The membrane is coated with a dielectric grease and slipped over the plug pins. Connector clamping force produce hydrostatic forces, first on each embossment which causes water remaining between the pin and the embossment ID and then pin-to-pin to be broken into a discontinuous series of microspheres. The resulting discontinuity produces full electrical isolation for the assembled pins and sockets and pin-to-pin for the mated connector. Total refurbishment of a connector may thus be accomplished in situ. Keywords: Patents; PAT-CL-439273.

0245 Liquid Metal Brush Material for Electrical Machinery Systems
O. P. Arora, J. H. Brady
Department of the Navy, Washington, DC
Filed 31 May 85, patented 18 Nov 86 6p
PATENT-4 623 514 Available from Comm. of Patents
This patent discloses a method for transferring current which uses a fusible alloy comprising from about 25.0 to about 48.0 weight percent bismuth, from about 0.8 to about 11.5 weight percent cadmium, from about 18.0 to about 53.5 weight percent indium, from 0.0 to about 24.0 weight percent lead, and from about 9.0 to about 17.0 weight percent tin.

Permanent Magnet Structure for Use in Electric Machinery
See 0269

0246 Right Angle Microwave Stripline Circuit Connector
F. J. Schiavone
Department of the Navy, Washington, DC
Filed 3 May 85, patented 23 Dec 86 9p
PATENT-4 631 505 Available from Comm. of Patents
This abstract discloses a connector between a stripline circuit and an coaxial conductor disposed at a right angle. The connector provides a low VSWR at relatively high frequencies and is attachable without soldering or separation of the circuit layers and with access from only one side of a first one of the circuit ground plane plates. This plate and an adjacent first outer dielectric circuit board have openings exposing a conductive stripe on a center board. The second plate is exposed by smaller openings in an adjacent second outer board and the center boards, and the connector has a body extending from the coaxial conductor to the second plate. The body has an outer conductor flatly and axially contacting the second plate and having a flange fitted to the smaller openings. The body has a tab extended radially from a central conductor and outwardly of the flange to engage the stripe. The body has a dielectric disposed between its conductors and extending axially between its ends and radially about the tab to the flange periphery. A dielectric ring is disposed about the flange filling the opening in the first board, and a flexible, conductive ring extends over the dielectric ring and between the flange and the first plate. The connector has a clamp ring axially engaging the flexible ring and the flange and secured to the second plate by screws extending through the rings. Patents.

0247 Solid State Electrical Switch Employing Materials with Reversible Phase Transistors
R. M. Williams
National Aeronautics and Space Administration, Pasadena, CA. Pasadena Office
Filed 29 Sep 89 18p
PAT-APPL-7-414 820 Available from NTIS: price code N03
A bistable switching element is made of a material whose electrical resistance reversibly decreases in response to intercalation by positive ions. Flow of positive ions between the bistable switching element and a positive ion source is controlled by means of an electrical potential applied across a thermal switching element. The material of the thermal switching element generates heat in response to electrical current flow therethrough, which in turn causes the material to undergo a thermal phase transition from a high electrical resistance state to a low electrical resistance state as the temperature increases above a predetermined value. Application of the electrical potential in one direction renders the tnermal switching element conductive to pass electron current out of the ion source. This causes positive ions to flow from the source into the bistable switching element and intercalate the same to produce a non-volatile, low resistance logic state. Application of the electrical potential in the opposite direction causes reverse current flow which de-intercalates the bistable logic switching element and produces a high resistance logic state.

0248 Underwater Mateable Electrical Connector
V. J. Marolda
Department of the Navy, Washington, DC
Filed 20 Sep 88, patented 20 Mar 90 5p
PATENT-4 909 751 Available from Comm. of Patents
This patent discloses a plug-receptacle type electrical connector in combination with a thin, circular, elastomeric membrane joining a plurality of cylindrical elastomeric embossments formed as an integral part thereof. Each embossment further has conical ends at each extremity and an outside diameter slightly larger than the receptacle socket cavity it will contact. Each embossment also has a longitudinal through-hole of inside diameter (ID) slightly smaller than the electrical connector plug pin it is intended to fit over. The membrane is coated with a dielectric grease and slipped over the plug pins. Connector clamping forces produce hydrostatic forces, first on each embossment which causes water remaining between the pin and the embossment ID and then pin-to-pin to be broken into a discontinuous series of microspheres. The resulting discontinuity produces full electrical isolation for the assembled pins and sockets and pin-to-pin for the mated connector. Total refurbishment of a connector may thus be accomplished in situ. Keywords: Patents, PAT-CL-439/273, Electrical isolation, Electrical equipment, Underwater equipment.

ELECTROTECHNOLOGY: Resistive, Capacitive, & Inductive Components

0249 Adjustable Twister
H. A. Leupold
Department of the Army, Washington, DC
Filed 14 Nov 89 19p
PAT-APPL-7-436 408 Available from NTIS: price code N03
This patent application discloses a permanent magnet structure comprising a linear array of hollow cylindrical flux source structures nested one within another about a common central axis. Each HCFS structure is free to displace linearly parallel to the central axis or to rotate about the axis. The array may be arranged by appropriate mechanical adjustment to provide periodic magnetic structures suitable for use as a wiggler or a twister.

0250 Block Patterning of the Metallization of Polyvinylidene Fluoride Transducers
G. I. Goo, T. A. Waters
Department of the Navy, Washington, DC
Filed 5 Jul 88 16p
PAT-APPL-7-215 136 Available from NTIS: price code N03
There is disclosed herein a composite sheet used as a transducer for producing voltage in response to intercepted mechanical or thermal stimuli. The composite sheet comprises a sheet such as polyvinylidene fluoride (PVDF) having at least one of piezoelectric and pyroelectric properties sandwiched between a plurality of thin film conductive blocks arranged in block patterns to establish there between a network of sensors. The composite sheet may be used to wallpaper a room for securing it against intrusion. The composite sheet provides transducer output with improved frequency response over a similar sized transducer without the block patterning. Electric shorting between opposed blocks does not interfere with voltage production in other areas of the composite sheet. Patent applications.

Device and Method for Providing Accurate Time and/or Frequency
See 0143

Device for Regulating Luminous Flux of Battery Powered Headlamp
See 0624

Digitally Controlled System for Effecting and Presenting a Selected Electrical Resistance
See 0243

0251 Edge Geometry Superconducting Tunnel Junctions Utilizing an Nbn/Mgo/Nbn Thin Film Structure
B. D. Hunt, H. G. Leduc
National Aeronautics and Space Administration, Pasadena, CA. Pasadena Office
Filed 1 Aug 89 14p
PAT-APPL-7-387 928 Available from NTIS: price code N03

An edge defined geometry is used to produce very small area tunnel junctions in a structure with niobium nitride superconducting electrodes and a magnesium oxide tunnel barrier. The incorporation of an MgO tunnel barrier with two NbN electrodes results in improved current-voltage characteristics, and may lead to better junction noise characteristics. The NbN electrodes are preferably sputter-deposited, with the first NbN electrode deposited on an insulating substrate maintained at about 250 to 500 C for improved quality of the electrode.

0252 Electrochemical Preparation of Silver Oxide Electrodes Having High Thermal Stability
D. R. Glen, A. N. Mansour, K. M. O'Neill, S. Dallek, B. F. Larrick
Department of the Navy, Washington, DC
Filed 2 Aug 89, patented 9 Jan 90 6p
PATENT-4 892 629 Available from Comm. of Patents

The shelf life of electrochemically prepared AgO cathodes is improved by increasing the temperature of anodization step to about 70 Deg C, or higher. At these elevated temperatures the capacity of the AgO electrode can also be increased by using a charge-discharge-charge regime. This invention relates to electrochemical cells and more particularly to silver oxide electrodes. Conventional methods of making silver oxide cathode material may be divided into two types: electro-chemical and chemical. In a typical electrochemical process, a sintered silver plate is anodized in a 31 weight percent KOH solution at room temperature. This method produces a cathode material that is capable of high rates of discharge but which has a very limited shelf life due to thermal instability. Chemically prepared silver oxide is made by the chemical oxidation of silver nitrate with potassium persulfate or ozone in KOH solution at 90 C. The chemically prepared material is more stable than the electrochemically prepared material but has not been use for high-power batteries because of its low electrical conductivity. It would be desirable to produce silver oxide (AgO) electrodes having both high electrical conductivity and high thermal stability and long shelf life. Keywords: Patents, PAT-CL-204-56.1.

0253 Enhanced Magnetic Field within Enclosed Annular Cavity
H. A. Leupold, E. Potenziani
Department of the Army, Washington, DC
Filed 14 Nov 89 21p
PAT-APPL-7-436 407 Available from NTIS: price code N03

The fabrication of a flux source using magnetically rigid material is disclosed for deriving a magnetic field of uniform density and enhanced magnitude within an enclosed annular cavity thereof. In the preferred embodiments, segments of the magnetically rigid material are configured and arranged in accordance with the desired direction of the magnetic field relative to the annular axis of the cavity. Patent application.

0254 Enhanced Magnetic Field within Enclosed Cylindrical Cavity
H. A. Leupold, E. Potenziani
Department of the Army, Washington, DC
Filed 14 Nov 89 17p
PAT-APPL-7-436 503 Available from NTIS: price code N03

The fabrication of a flux source using magnetically rigid material is disclosed for deriving a magnetic field of uniform density and enhanced magnitude within an enclosed cylindrical cavity thereof. In the preferred embodiments, segments of the magnetically rigid material are configured and arranged in the flux source to direct the magnetic field in parallel with the cylindrical axis of the cavity. Patent applications.

0255 Extended foil capacitor with radially spoked electrodes
J. C. Foster
General Electric Co., St. Petersburg, FL. Pinellas Peninsula Plant.; Department of Energy, Washington, DC
Filed 20 Apr 89 10p
PAT-APPL-7-340 822 Available from NTIS: price code A02

An extended foil capacitor has a conductive disk electrically connected in noncrushing contact to the extended foil. A conductive paste is placed through spaces between radial spokes on the disk to electrically and mechanically connect the extended foil to the disk.

0256 Fabrication of NbN Based Electronic Devices with Silicon Barriers
E. Cukauskas, W. Carter
Department of the Navy, Washington, DC
Filed 30 Jun 89 12p
PAT-APPL-7-374 035 Available from NTIS: price code N03

A method of making a Josephson Junction is disclosed which includes the steps of depositing a base electrode layer of a refractory superconducting material on a substrate, depositing a first a passivation layer on the base electrode, depositing a barrier layer of refractory insulating semiconducting material on the passivation layer, depositing a second passivation layer on the barrier layer, and depositing a counter electrode on the second passivation layer. The layers are deposited at a substrate temperature of from about 5 C to about 7 C in an Ultra-High Vacuum sputtering system at a base pressure of less than or equal to 5 x 10 to the 8th power Torr. In the preferred embodiment a base electrode and counter electrode of NbN are separated by a barrier layer of hydrogenated silicon. When exposed to high post processing temperatures this structure maintains a chemically stable interface with the substrate. Keywords: Patent applications.

Fabrication of Permanent Magnet Toroidal Rings
See 0900

0257 Heterogeneous Composite and Method of Making
W. L. Wade, R. J. Mammone, M. Binder
Department of the Army, Washington, DC
Filed 3 Nov 89 9p
PAT-APPL-7-431 277 Available from NTIS: price code N03
This invention relates in general to heterogeneous composites and to their method of making and in particular to a free-standing, flexible heterogeneous composite of insulating polymeric film containing relatively small percentages of electrically conductive polymer wherein the conductive polymer exists as the dispersed phase and to their method of making. Polymers designed with high dielectric constants, low dissipation factors and high electric field breakdown strengths have application as dielectrics in capacitors for communication equipment, computers, and space power systems. Patent applications.

0258 High Energy Product Radially Oriented Toroidal Magnet and Method of Making
H. A. Leupold
Department of the Army, Washington, DC
Filed 10 Jul 89 9p
PAT-APPL-7-379 033 Available from NTIS: price code N03
A high energy product radially oriented toroidal magnet is made from an iron cylinder toroid by a method including the steps of: (a) sandwiching the iron cylinder toroid between two disc toroids of a superconductive material at a temperature above the transition temperature of the superconductive material, (b) aligning the iron radially with a small applied field, (c) cooling the superconductive material to below the transition temperature of the superconductive material thereby trapping magnetic flux in the iron cylinder toroid, and (d) removing the small applied field. Patent applications.

0259 High Power Transducers
A. E. Clark
Department of the Navy, Washington, DC
Filed 30 Jun 89 12p
PAT-APPL-7-374 119 Available from NTIS: price code N03
Magnetic energy is converted into mechanical energy by applying a changing magnetic field to a rare earth alloy of the formula Tb(x)Dy(l-x) at a temperature in the range of about K to 170K, wherein x and the operating temperature are selected to minimize the basal plane anisotropy. Keywords: Patent application.

0260 High Quality Tunnel Junction Devices Using High T(c) Superconductors
R. J. Soulen, S. A. Wolf
Department of the Navy, Washington, DC
Filed 30 Jun 89 14p
PAT-APPL-7-373 555 Available from NTIS: price code N03
This invention relates generally to superconducting devices and, specifically, to tunnel junctions and Josephson junctions in superconducting devices. A structure and method for fabricating tunnel junctions from high transition temperature material are disclosed. A tunnel junction consists of three films successively deposited on a substrate: a superconductor, an insulator or normal metal and a superconducting or normal metal. The critical interface is between the superconductor and the insulator or normal metal. Previous attempts to form tunnel junctions have used the upper surface of the superconductor which is invariably rough and inhomogeneous. This invention uses the lower surface which is more epitaxial to fabricate tunnel junctions and Josephson junctions. Patent Applications.

0261 Low Power Consumption Current Transducer
W. T. Mclyman
National Aeronautics and Space Administration, Pasadena, CA. Pasadena Office
Filed 15 Dec 87, patented 18 Apr 89 7p
PATENT-4 823 074 Available from Comm. of Patents
A low power consumption current transducer utilizes a saturable core reactor which includes a pair of opposed gate windings and a control winding. The control winding of the saturable reactor is arranged to receive the current to be measured. A square wave generator is connected to the gate winding of the transformer connected across the square wave generator and the secondary connected in series with the gate windings of the reactor. A full wave rectifier is connected to the gate windings and a resistor is connected across the rectifier to provide a DC voltage to cross it representative of the current flow through the control winding. A DC power supply is provided to supply power to the square wave voltage source. A diode is connected between each end of the primary winding of the transformer and one polarity of the DC power supply to commutate the reactive current resulting from the counter emf generated in the reactor back to the DC supply to eliminate potentially damaging reactive voltage spikes which would otherwise appear at the output of the square wave generator and conserve energy.

0262 Means for Improving Turnaround Time Stability for R-C Energy Detectors
V. A. Andersen
Department of the Navy, Washington, DC
Filed 3 Feb 89, patented 3 Apr 90 9p
PATENT-4 914 640 Available from Comm. of Patents
In combination with any signal processor system which us es an R-C integrator type energy detector to recognize the presence of electrical signals such as those that are proportional to a received acoustic ping signal, the turnaround time stability improvement is disclosed comprising a timing initiation signal recognition means a validation means, first and second, one-shorts for A/D conversion, and AND gate means for receiving the timing initiation signal and the validation signal and outputting a valid ping timing signal only when both are true, said valid ping timing signal in turn causing subsequent actions normally initiated by this event to occur, such as a transponder system incorporation the present invention projecting a return ping into the water. Patents.

0263 Method and Apparatus to Enhance the Sensitivity of Cylindrical Magnetostrictive Transducer to Magnetic Fields
A. M. Yurek
Department of the Navy, Washington, DC
Filed 15 Apr 88, patented 25 Jul 89 5p
PATENT-4 850 098 Available from Comm. of Patents
This patent discloses a fiber optic sensor using the treated coil of optical fiber as a structural support system for the sensor, and a method for making such a sensor.

0264 Method of Making a Resonator from a Boule of Lithium Tetraborate and Resonator So Made
A. Ballato, J. A. Kosinski
Department of the Army, Washington, DC
Filed 13 Sep 89 8p
PAT-APPL-7-406 933 Available from NTIS: price code N03

This invention relates in general to a method of making a temperature compensated resonator and to the resonator so made, and in particular to a method of making a temperature compensated resonator from a boule of lithium tetraborate and to the resonator so made. Lithium tetraborate, Li2B4O7, is an insulating dielectric material that is piezoelectric but is not ferroelectric. This means that it is capable of being mechanically stimulated into vibration (piezolectric effect) but it is not necessary to subject the material to poling such as would be required for a ferroelectric material such as lithium niobate (LiNbO3). Furthermore, Li2B4O7 is not enantiomorphous. This means that it does not have the disadvantage of twinning as quartz. Li2B4O7 has moderate piezoelectric coupling and orientations at which the first order temperature coefficient of frequency is zero. The general object of this invention is to provide a resonator characterized by frequency insensitivity to temperature variations. A more particular object of the invention is to provide a resonator in which both the first- and the second-order temperature coefficient of frequency are substantially zero. Patent application.

0265 Method of Making a Transducer from a Boule of Lithium Tetraborate and Transducer so Made
A. Ballato, J. A. Kosinski
Department of the Army, Washington, DC
Filed 23 Oct 89 9p
PAT-APPL-7-425 539 Available from NTIS: price code N03

The general objective of this invention is to provide a transducer characterized by frequency insensitivity to temperature variations. A specific objective of the invention is to provide a transducer in which both the first- and the second- order temperature coefficients of frequency are substantially zero. Another objective of the invention is to provide a transducer in which the piezoelectric coupling is large. Still another objective of the invention is to provide a transducer in which the piezoelectric coupling is large for thickness shear mode of vibration. The aforementioned objectives can be attained by providing a transducer in which Lithium Tetraborate is oriented with respect to its crystallographic axes to form a plate having a doubly rotated orientation of Phi = 17 to 21 degs and theta = 54 to 58 degs where doubly rotated orientations are described by the IEEE notation widely known as (YXwl)Phi/Theta and in which the plate is lapped and polished and metallic electrodes then deposited on the major surfaces of the plate, the plate then mounted in an evacuated sealed enclosure to form a transducer and the transducer subjected to an alternating voltage across the electrodes at a frequency that piezoelectrically excites the fundamental harmonic of the thickness shear mode. Keywords: Patent applications.

Method of Modifying the Dielectric Properties of an Organic Polymer Film
See 0080

0266 Method of Preparing a Quartz Surface for Sweeping
J. G. Gualtieri
Department of the Army, Washington, DC
Filed 11 Sep 89 10p
PAT-APPL-7-405 822 Available from NTIS: price code N03

A quartz surface is prepared for sweeping by a method including the steps of: (A) cleaning the quartz surface, (B) depositing a metal electrode onto the cleaned quartz surface, and (C) creating periodic openings in the metal electrode in such a manner that the metal is not disconnected by the 10 arrangement of openings and all the metal is at one potential. Patent applications.

0267 Monolithic RF/EMI Desensitized Electroexplosive Device
T. A. Baginski
Department of the Navy, Washington, DC
Filed 5 Dec 88, patented 16 Jan 90 6p
PATENT-4 893 563 Available from Comm. of Patents

This patent discloses a device to protect electromagnetic devices and the method to manufacture the device is disclosed. The novel structure is inherently immune to sinusoidal radio frequency (RF) radiation, and also offers protection against stray signals induced by RF arcing. A main feature is the monolithic construction which reduces dramatically the coupling area for direct RF radiation. An oxide layer is thermally grown on silicate substrate to form a dielectric, then a resistive layer of nichrome is sputtered to form a heating element. This process places the resistive bridgewire in direct contact with distributed capacitance.

Multiple Axis, Fiber Optic Interferometric Seismic Sensor
See 0204

Noise-Suppressing Hydrophones
See 0916

Non-Volatile Memory Cell with Ferroelectric Capacitor Having Logically Inactive Electrode
See 0357

Overlap Correlator Synthetic Aperture Processor
See 0183

0268 Permanent Magnet Field Sources of Conical Orientation
H. A. Leupold, E. Potenziani
Department of the Army, Washington, DC
Filed 14 Nov 89 16p
PAT-APPL-7-436 402 Available from NTIS: price code N03

This patent application discloses a magnetic structure fabricated of magnetically rigid materials which combines a radial magnetic field source with an axial magnetic field source to produce a conical field source. The radial magnetic field source typically comprises a substantially annular enclosed cavity with an internal magnetic field oriented perpendicular to the annular axis of the cavity. The axial magnetic field source most likely comprises a substantially cylindrical enclosed cavity with an internal magnetic field oriented parallel to the cylindrical axis of the cavity.

0269 Permanent Magnet Structure for Use in Electric Machinery
H. A. Leupold, E. Potenziani
Department of the Army, Washington, DC
Filed 14 Nov 89 20p
PAT-APPL-7-436 406 Available from NTIS: price code N03
Magnetically rigid materials are utilized to enhance the field magnitudes produced by permanent magnet structures that are utilized in electric machinery. Magnetic circuit losses due to unnecessary magnetic fields are eliminated without employing a conventional shunt. The magnetically rigid material is cylindrically configured and magnetized to provide individual magnetic fields between sets of north and south poles on only one cylindrical surface thereof. At least one coaxial cylinder of the magnetically rigid material is included in each permanent magnet structure of the invention and each of the cylinders is constructed from a plurality of segments in one preferred embodiment thereof. Segments having a substantially triangular cross-sectional configuration are utilized in other preferred embodiments, while flux contributions from at least three segments combine to sustain each set of north and south poles in still other preferred embodiments. Patent applications.

0270 Polarized Rotary Solenoid
G. E. Cooksey
Department of the Navy, Washington, DC
Filed 9 Feb 87, patented 5 Apr 88 7p
PATENT-4 736 175 Available from Comm. of Patents
A rotary solenoid providing opposite direction pivoting movement on opposite polarity d.c. energization. The solenoid has a pivoting shaft from which a permanent magnet armature having ends of opposite magnetic polarity extends transversely and oppositely. The armature is disposed between a pair of pole pieces each of which extends along the armature between its ends. The pole pieces are oppositely electromagnetically magnetized by a d.c. winding so that reversing the electrical polarity of the winding reverses the polarity of each pole piece and its attraction of repulsion of the armature ends. The pole pieces are opposite arms of a U-shaped ferromagnetic structure on which the winding is centrally wound, and the shaft is supported by a bearing in a nonferromagnetic bridge between the pole pieces. Patents.

Saw Slanted Array Correlator (Sac) with Separate Amplitude Compensation Channel
See 0174

0271 SAW (Surface Acoustic Wave) Transducer with Improved Bus-Bar Design
E. A. Mariani, C. S. Hartmann
Department of the Army, Washington, DC
Filed 25 Sep 89 15p
PAT-APPL-7-412 054 Available from NTIS: price code N03
A surface acoustic wave (SAW) transducer comprises a piezoelectric substrate, a paid of metal bus bars positioned on the substrate parallel to and separated from each other a preselected distance and a plurality of interdigital electrode fingers extending from each of the metal bus bars. A plurality of slots are positioned along each metal bus bar so that the bus bar metallization is reduced and the acoustic wave velocity is increased in the metal bus bar region. Patent applications.

Semi-Foamed Polyethylene Molding Tape
See 0588

Single Element Magnetic Suspension Actuator
See 0476

0272 System for Detection of Transducer Defects
M. B. Moffett, W. L. Konrad
Department of the Navy, Washington, DC
Filed 30 Sep 82, patented 1 May 84 6p
PATENT-4 445 361 Available from Comm. of Patents
Apparatus and method for nondestructive detection of loose parts or faulty bonds in sound transducers by measuring erratic second-order nonlinear difference-frequency responses of the test transducer to a pulsed high level dual-frequency sound field produced by a high power projector. Such field may be generated by combining a high frequency carrier signal at frequency fo with a low frequency tone burst signal at frequency f/2 in a double balanced modulator so as to produce the dual-frequency pulse at fo+f/2 and fo-f/2. The test transducer converts the dual-frequency pulse into a plurality of linear and nonlinear frequency components including the difference-frequency f. These are then fed through a passive low-pass filter to eliminate the high frequency components, amplified by a pre-amplifier, further filtered by a bandpass filter to eliminate the DC component, leaving only the difference-frequency f which is amplified by a post-amplifier and displayed on a cathode-ray oscilloscope triggered by synchronizing pulses from the tone burst oscillator. Rapid variations in the difference-frequency signal level and phase indicate a loose part or bond. US-PAT-73-1.

0273 Temperature Stable Ceramic Dielectric Compositions
R. C. Buchanan, A. K. Maurice
Department of the Navy, Washington, DC
Filed 12 Jun 89 16p
PAT-APPL-7-364 416 Available from NTIS: price code A03
This invention relates to ceramic dielectric insulating materials. More specifically, it relates to a ceramic material having a high dielectric constant with low temperature dependence and low energy loss, for use in the manufacture of compact ceramic capacitors. It further relates to a method of making such ceramic material. A high dielectric constant is essential for the manufacture of compact ceramic capacitors. For a given desired capacitance, other properties being equal, the size of a capacitor is inversely proportional to the dielectric constant. A high dielectric constant thus allows a given capacitance to be provided in a small component. Patent application.

0274 Terbium-Dysprosium Magnetostrictive High Power Transducers
A. E. Clark
Department of the Navy, Washington, DC
Filed 30 Jun 89, patented 6 Mar 90 6p
PATENT-4 906 879 Available from Comm. of Patents
Magnetic energy is converted into mechanical energy by applying a changing magnetic field to a rare earth alloy of the formula. Tb(x)Dy(1-x) at a temperature in the range of about 0 K. to 170 K,. wherein x and the operating temperature are selected to minimize the basal plane anisotropy. Patents.

ELECTROTECHNOLOGY: Semiconductor Devices

0275 CMOS Analog Four-Quadrant Multiplier
P. A. Shoemaker, G. L. Haviland, I. Lagnado
Department of the Navy, Washington, DC
Filed 12 Jan 89, patented 6 Mar 90 12p
PATENT-4 906 873 Available from Comm. of Patents
A four-quadrant analog multiplier circuit provides an output which is proportional to two voltage inputs. The circuit includes a pair of depletion mode transistors having gain constants equal in magnitude and threshold voltages equal in magnitude. The gates of the transistors are coupled in common. One input is applied to the common gates. The other input and its inverse are separately applied to source/drain terminals of the two transistors. Patents.

0276 Design and Fabrication Sequence for InP Junction FETS and Junction HEMTS
J. B. Boos
Department of the Navy, Washington, DC
Filed 29 Dec 89 25p
PAT-APPL-7-459 155 Available from NTIS: price code N03
This invention is directed to a novel process of fabricating indium phosphide junction field-effect transistors (JFETs) and indium phosphide junction high electron mobility transistors (JHEMTs) and more particularly to such processes which utilize a nitride-registered gate approach to obtain JFETs and JHEMTs having sub-micron gate lengths. The sub-micron gate semiconductor device includes source, drain, gate regions and a channel region connecting the source and drain regions. The fabrication sequence begins by growing a first insulating layer on a semiconductor structure including a substrate and a channel region. Next, source and drain regions are delineated through the first insulating layer and source and drain regions are implanted into a substrate. A second insulating layer is then grown on the first insulating layer. A photoresist layer is then applied and a gate photoresist opening is delineated above the second insulating layer. The first and second insulating layers are then patterned by anisotropic etching to limit the amount of undercutting while using the photoresist layer as a mask. A first ion selected from a group consisting of Phosphorus and Arsenic, and a second ion selected from the group consisting of Beryllium, Zinc, and Cadmium are sequentially implanted through the gate opening into the gate region down to the channel region. Keywords: Ion implantation; Epitaxial growth; Patent applications.

Digitally Controlled System for Effecting and Presenting a Selected Electrical Resistance
See 0243

0277 FET Oscillator Having Controllable Reactance Element-Controlled Two Port Feedback Network
C. Rauscher
Department of the Navy, Washington, DC
Filed 9 Mar 81, patented 2 Jun 87 6p
PATENT-4 670 722 Available from Comm. of Patents
A broadband high frequency power oscillator employing a GaAs FET transistor and a two-port coupling network whose input port is connected across the drain and source terminals of the GaAs FET. The coupling network consists of 3 branches in T- or pi configuration. One branch includes a matching network and the load. The other two branches are purely reactive and each includes at least one independently tunable reactance element, such as a varactor. PAT-CL-331-117.

0278 Field Emitter Array Integrated Distributed Amplifiers
H. F. Gray, R. F. Greene
Department of the Navy, Washington, DC
Filed 22 Mar 88, patented 13 Feb 90 28p
PATENT-4 901 028 Available from Comm. of Patents
Distributed amplifiers in integrated circuit form wherein dielectric material and electrically conductive material combine to form field emitter cathodes, grids, and anodes in a module forming one or more amplifier cells embedded in a matrix of reactive impedances that form companion stripline-like transmission lines in a vacuum or sufficiently low pressure gas such that electrons remain unscattered during travel over trajectories from cathode to anode in a cell. Patents.

0279 Formation of Epitaxial Si-Ge Heterostructures
S. M. Prokes, W. F. Tseng, A. Christou
Department of the Navy, Washington, DC
Filed 15 Dec 89 12p
PAT-APPL-7-450 963 Available from NTIS: price code N03
This invention relates to an improved method of forming epitaxial Si -Ge heterostructures. It is an object of this invention to form epitaxial SiGe layers by a method that is not dependent on special wafer cleaning, vacuum deposition, or implantation. It is also an object of this invention to form epitaxial SiGe layers by a method that is not dependent on wafer size. It is also an object of this invention to form epitaxial SiGe layers without special or extensive equipment. It is also an object of this invention to form epitaxial SiGe layers by a repeatable and reliable epitaxial formation system. These and additional objects of the invention are accomplished by depositing a layer of amorphous SiGe on a silicon wafer and wet oxidizing the silicon wafer/amorphous SiGe in order to form an epitaxial SiGe heterostructure. Keywords: Patent applications.

0280 High Power Diamond Traveling Wave Amplifier
M. N. Yoder
Department of the Navy, Washington, DC
Filed 25 Sep 87, patented 29 May 90 11p
PATENT-4 929 986 Available from Comm. of Patents
An FET device is especially useful in common gate amplifier circuits used as amplifiers of microwave and millimeter wave signals. The device has a diamond film layer constituting the device's channel. Device geometry is selected so that, in a common gate amplifier circuit, device input and output are impedance matched to avoid phase cancellation between input and output. In one embodiment a boron nitride layer is disposed heteroepitaxially with the diamond channel and separating the channel from the gate. In another embodiment plural such devices are yoked together integrally source to drain in such a manner that charge carriers entering the second and subsequent stages do so at maximum velocity without the need to accelerate from zero or low velocity. The resulting device has a higher power handling capacity, upper frequency range, and dynamic range. Patents.

0281 High Temperature Flexible Seal
B. M. Steinetz, P. J. Sirocky
National Aeronautics and Space Administration, Cleveland, OH. Lewis Research Center
Filed 30 Dec 88, patented 17 Apr 90 9p
PATENT-4 917 302 Available from Comm. of Patents
This device is concerned with sealing the sliding interfaces between structural panels that are roughly perpendicular to each other or whose edges are butted against one another. The gap which the seal element must seal is not uniform along the seal length requiring significant seal flexibility. The seal is mounted in a rectangular groove in a moveable structural panel. The seal comprises a plurality of rectangular shaped wafers stacked next to one another and preloaded in the axial direction to minimize leakage between wafers. The wafers are laterally preloaded to maintain sealing contact along the wafer faces which engage the adjacent wall of a sidewall using one of several approaches, such as the pressurized linear bellows. The seal accommodates distortions in the adjacent panel by relative sliding between adjacent wafers. Leakage between wafers is further minimized with good wafer surface finishes. Leakage between the seal nose and the adjacent structural panel is minimized when sealing against a distorted sidewall with relatively thin wafers and suitable seal preload apparatus. Leakage behind the seal is minimized with good groove tolerances and good sealing contact between the preload system and the back of the peripheral edge of the wafers.

0282 Integrated Circuit Reliability Testing
M. G. Buehler, H. R. Sayah
National Aeronautics and Space Administration, Pasadena, CA. Pasadena Office
Filed 5 Dec 88 14p
PAT-APPL-7-279 676 Available from NTIS: price code A03
A technique is described for use in determining the reliability of microscopic conductors deposited on an uneven surface of an integrated circuit device. A wafer containing integrated circuit chips is formed with a test area having regions of different heights. At the time the conductors are formed on the chip areas of the wafer, an elongated serpentine assay conductor is deposited on the test area so the assay conductor extends over multiple steps between regions of different heights. Also, a first test conductor is deposited in the test area upon a uniform region of first height, and a second test conductor is deposited in the test area upon a uniform region of second height. The occurrence of high resistances at the steps between regions of different height is indicated by deriving the measured length of the serpentine conductor using the resistance measured between the ends of the serpentine conductor, and comparing that to the design length of the serpentine conductor. The percentage by which the measured length exceeds the design length, at which the integrated circuit will be discarded, depends on the required reliability of the integrated circuit.

0283 Laterally Stacked Schottky Diodes for Infrared Sensor Applications
T. Lin
National Aeronautics and Space Administration, Pasadena, CA. Pasadena Office
Filed 9 Jun 89 12p
PAT-APPL-7-363 815 Available from NTIS: price code A03
Laterally stacked Schottky diodes for infrared sensor applications are fabricated utilizing porous silicon. A Schottky metal contract is formed in the pores, such as by electroplating. The sensors may be integrated with silicon circuits on the same chip with a high quantum efficiency, which is ideal for IR focal plane array applications due to uniformity and reproducibility.

0284 Method of Forming a Multiple Layer Dielectric and a Hot Film Sensor Therewith
P. Hopson, S. Q. Tran
National Aeronautics and Space Administration, Hampton, VA. Langley Research Center
Filed 1 Apr 88, patented 17 Apr 90 9p
PATENT-4 917 940 Available from Comm. of Patents
The invention is a method of forming a multiple layer dielectric for use in a hot-film laminar separation sensor. The multiple layer dielectric substrate is formed by depositing a first layer of a thermoelastic polymer such as on an electrically conductive substrate such as the metal surface of a model to be tested under cryogenic conditions and high Reynolds numbers. Next, a second dielectric layer of fused silica is formed on the first dielectric layer of thermoplastic polymer. A resistive metal film is deposited on selected areas of the multiple layer dielectric substrate to form one or more hot-film sensor elements to which aluminum electrical circuits deposited upon the multiple layered dielectric substrate are connected.

0285 Method of Making Self-Aligned GaAs/AlGaAs FET's
J. E. Davey, A. Christou
Department of the Navy, Washington, DC
Filed 27 Jun 89 23p
PAT-APPL-7-371 778 Available from NTIS: price code N03
A method of making a self-aligned FET includes the following steps. First, a selectively doped heterostructure substrate having a predetermined crystalline structure is obtained having a heavily doped top GaAs layer, having a heavily doped AlGaAs layer under the top layer that is resistant to orientation-dependent etching, and having an undoped underlying AlGaAs layer is deposited on the top layer. Then, an uppermost GaAs layer is deposited on the top layer. Then, an angular recess is etched through the uppermost GaAs layer and through the top heavily doped GaAs layer of the heterostructure substrate with an orientation-dependent etchant down to the etch resistant AlGaAs layer, whereby the length of the angular recess is wider at the base of the recess than at the top of the recess because of the predetermined crystalline structure and the orientation-dependent etchant. Next, a refractory metal gate of tantalum silicide is deposited in the recess. The length of the refractory metal gate is substantially the same as the length of the top of the recess and is aligned therewith. The refractory metal gate is then covered with an etch resistant polyimide material. Patent applications.

0286 Method of Making Self-Aligned GaAs/AlGaAs FET's
J. E. Davey
Department of the Navy, Washington, DC
Filed 27 Jun 89, patented 22 May 90 8p
PATENT-4 927 782 Available from Comm. of Patents
A method of making a self-aligned Field Effect Transistors (FET) includes the following steps. First, a selectively doped heterostructure substrate having a predetermined crystalline structure is obtained having a heavily doped top GaAs layer, having a heavily doped AlGaAs layer under the top layer that is resistant to orientation-dependent etching,

and having an undoped underlying AlGaAs layer and an undoped bottom GaAs layer. Then, an uppermost GaAs layer is deposited on the top layer. Then, an angular recess is etched through the uppermost GaAs layer and through the top heavily doped GaAs layer of heterostructure substrate with an orientation-dependent etchant down to the etch resistant AlGaAs layer, whereby the length of the angular recess is wider at the base of the recess than at the top of the recess because of the predetermined crystalline structure and the orientation-dependent etchant. Next, a refractory metal gate of tantalum silicide is deposited in the recess. The length of the refractory metal gate is then covered with an etch resistant polyimide material. By subsequent steps including etching, source and drain implantation, and deposition of metal contacts, the fabrication of the self-aligned FET is completed. Patents.

0287 Method of Producing a Thin Silicon-on-Insulator Layer
D. J. Godbey, H. L. Hughes, F. J. Kub
Department of the Navy, Washington, DC
Filed 29 Sep 89 18p
PAT-APPL-7-414 225 Available from NTIS: price code N03
A process for fabricating thin film silicon wafers using a novel etch stop composed of a silicon-germanium alloy includes properly doping a prime silicon wafer for the desired application, growing a strained Si(1-x)Ge(x) alloy layer onto seed wafer to serve as an etch stop, growing a silicon layer on the strained alloy layer with a desired thickness to form the active device region, oxidizing the prime wafer and a test wafer, bonding the oxide surfaces of the test and prime wafers, machining the backside of the prime wafer and selectively etching the same to remove the silicon, removing the strained alloy layer by a non-selective etch, thereby leaving the device region silicon layer. In an alternate embodiment, the process includes implanting germanium, tin, or lead ions to form the strained etch stop layer. Keywords: Semiconductors; Patent applications.

0288 Microprocessor Chip Incorporating Optical Signal Coupling Receiver
D. H. Nhu
Department of the Navy, Washington, DC
Filed 23 Feb 90 12p
PAT-APPL-7-483 686 Available from NTIS: price code N03
Microprocessor and transceiver circuitry are incorporated into a single chip for enhanced, high speed operation of an electronic circuit board by use of optical fiber connections between two or more of such single chips and external peripherals. The transceiver circuitry includes transmitter and receiver sections through which the optical signals are respectively generated and received by a light emitting diode and a photo-diode. Patent applications.

0289 Microwave Field Effect Transistor
H. Huang
National Aeronautics and Space Administration, Greenbelt, MD. Goddard Space Flight Center
Filed 29 Nov 84, patented 27 Jun 89 12p
PATENT-4 843 440 Available from Comm. of Patents
Electrodes of a high power, microwave field effect transistor are substantially matched to external input and output networks. The field effect transistor includes a metal ground plane layer, a dielectric layer on the ground plane layer, a gallium arsenide active region on the dielectric layer, and substantially coplanar spaced source, gate, and drain electrodes having active segments covering the active region. The active segment of the gate electrode is located between edges of the active segments of the source and drain electrodes. The gate and drain electrodes include inactive pads remote from the active segments. The pads are connected directly to the input and output networks. The source electrode is connected to the ground plane layer. The space between the electrodes and the geometry of the electrodes establish parasitic shunt capacitances and series inductances that provide substantial matches between the input network and the gate electrode and between the output network and the drain electrode. Many of the devices are connected in parallel and share a common active region, so that each pair of adjacent devices shares the same source electrodes and each pair of adjacent devices shares the same drain electrodes. The gate electrodes for the parallel devices are formed by a continuous stripe that extends between adjacent devices and is connected at different points to the common gate pad.

Miniaturization of Flight Deflection Measurement System
See 0932

0290 Niobium and Niobium Nitride Contacts on Semiconducting Material
E. Cukauskas, W. Carter, J. Pond, H. Newman
Department of the Navy, Washington, DC.; National Aeronautics and Space Administration, Washington, DC
Filed 30 Jun 89 19p
PAT-APPL-7-374 101 Available from NTIS: price code A03
This invention related generally to a metallization layer of niobium or niobium nitride on a semiconductor in an integrated circuit structure which can function from the superconducting temperature regime to above room temperature. Niobium or niobium nitride is deposited onto a heated gallium arsenide substrate. This metallization will maintain chemical stability after high temperature post processing. These materials provide a low resistivity metallization suitable for Schottky contacts used over a wide operating temperature range and are superconducting at low temperatures.

0291 Null Offset Voltage Compensator for Operational Amplifier
L. R. Groehl
Department of the Army, Washington, DC
Filed 14 Aug 89 13p
PAT-APPL-7-393 610 Available from NTIS: price code N03
The null offset voltage of an operational amplifier is compensated with diodes connected at the output terminal thereof. These diodes are either forward biased and/or backbiased to block current flow from the operational amplifier until the output voltage thereof exceeds the offset voltage level. Patent applications.

0292 OPFET (Optical Field-Effect Transistor) Demodulator-Downconverter for Detecting Microwave Modulated Optical Signals
C. Rauscher
Department of the Navy, Washington, DC
Filed 28 May 87, patented 8 Aug 89 8p
PATENT-4 856 095 Available from Comm. of Patents
A field-effect transistor performs four functions, namely signal demodulation, generation of a local oscillator signal, generation of harmonics of this local oscillator signal through frequency multiplication, and mixing of the demodu-

lated signal with either the local oscillator signal or one of its harmonics to produce a signal at a lower intermediate frequency; the field-effect transistor being the key element in a demodulator-downconversion circuit. Keywords: Demodulators; Down converters; Optical field effect transistors. Patents. PAT-CL-455-619.

Organometallic Antimony Compounds Useful in Chemical Vapor Deposition Processes
See 0086

Oxidation of Semiconductors and Superconductors
See 0917

0293 Passivating Layer for III-V Semiconductor Materials
B. T. Jonker, G. A. Prinz, J. J. Krebs
Department of the Navy, Washington, DC
Filed 30 Mar 88, patented 9 May 89 5p
PATENT-4 828 935 Available from Comm. of Patents
This invention relates to a semiconductor structure in which an epitaxial semiconductor layer is used to electrically passivate and insulate the semiconductor on which it is deposited. In today's world, developments in electronic devices demand faster and faster reaction speed. We have found that the Zinc Selenide binary semiconductors and alloys of this invention having the general formula Zn(1-x-y)M(x)Q(y)Se:D provide a suitable passivating layer for III-V semiconductor materials which sufficiently minimizes surface state density, surface charge accumulation or charge carrier recombination to significantly improve practical electronic device operation. PAT-CL-428-642.

0294 Reflection Technique for Thermal Mapping of Semiconductors
M. J. Walter
Department of the Air Force, Washington, DC
Filed 28 Dec 87, patented 20 Jun 89 6p
PATENT-4 841 150 Available from Comm. of Patents
Semiconductors may be optically tested for their temperatures by illuminating them with tunable monochromatic electromagnetic radiation and observing the light reflected off of them. A transition point will occur when the wavelength of the light corresponds with the actual band gap energy of the semiconductor. At the transition point, the image of the semiconductor will appreciably darken as the light is transmitted through it, rather than being reflected off of it. The wavelength of the light at the transition point corresponds to the actual band gap energy and the actual temperature of the semiconductor. Patents.

RF Phase Shifter
See 0236

Scanning Electron Microscopy by Photovoltage Contrast Imaging
See 0922

Selective Metallization of Carbonyl-Containing Polymer Films
See 0096

0295 Semiconductor Heterojunction Device with Graded Bandgap
T. K. Chu
Department of the Navy, Washington, DC
Filed 27 Apr 90 9p
PAT-APPL-7-517 013 Available from NTIS: price code N03
This invention relates generally to rectifying junction types of semiconductor devices and more particularly to a heterojunction structure with a graded gap region at its interface. Semiconductor rectifying junction devices are widely utilized in electronic and electro-optic installations, including by way of example infrared photovoltaic detectors. The most commonly utilized semiconductor devices are of the p-n junction and Schottky junction types. In the p-n junction device, p-type and n-type classes of materials are deposited on each other and arranged to minimize migration of dopants across the junction. Keywords: Patent applications.

0296 Sensitization Pretreatment of PB-Salt Epitaxial Films for Schottky Diodes by Sulfur Vapor Exposure
T. K. Chu, F. Santiago
Department of the Navy, Washington, DC
Filed 19 Jul 89, patented 13 Feb 90 7p
PATENT-4 900 373 Available from Comm. of Patents
This abstract discloses a process for preparing an infrared sensitive photodiode comprising the steps of: 1) forming by vacuum deposition an epitaxial layer of a semiconductor alloy material selected from the group consisting of Lead Selenide, Lead Telluride, PbSe(x)Te(1-x), Pb(y)Sn(1-y)Se, Pb(y)Sn(1-y)Te, Pb(y)Sn(1-y)Se(x)Te(1-x), Pb(z)Cd(l-z)Se, Pb(z) Cd(l-z)Te, and Pb(z)Cd(l-z)Se(x)Te(l-x), wherein) $0<x<1, 0<y<1$, and $0<=<1$, to cover at least a portion of the surface of a substrate composed of an infrared transparent single crystal material selected from the group consisting of alkali metal halides and alkaline earth halides; coating the epitaxial layer of semiconductor alloy material with a thin layer of a lead halide selected from the group consisting of Lead chloride, Lead bromide, Lead fluoride, and mixtures thereof by exposing the epitaxial layer alloy material to vapor of the lead halide in the presence of a gas selected from the group consisting of air, oxygen, and oxygen/inert gas mixtures; 3) vacuum depositing Pb metal onto a portion of the lead halide coated epitaxial layer of semiconductor alloy material to form a non-Ohmic Pb metal contact; and 4) forming an Ohmic contact on another portion of epitaxial layer of semiconductor alloy materials. Patents.

0297 Soft x-ray reduction camera for submicron lithography
A. M. Hawryluk, L. G. Seppala
Lawrence Livermore National Lab., CA.; Department of Energy, Washington, DC
Filed 9 Feb 89 34p
PAT-APPL-7-308 332 Available from NTIS: price code A03
Soft x-ray projection lithography can be performed using x-ray optical components and spherical imaging lenses (mirrors), which form an x-ray reduction camera. The x-ray reduction is capable of projecting a 5(times) demagnified image of a mask onto a resist coated wafer using 4.5 nm radiation. The diffraction limited resolution of this design is about 135 nm with a depth of field of about 2.8 microns and a field of view of 0.2 cm(sup 2). X-ray reflecting masks (patterned x-ray multilayer mirrors) which are fabricated on thick substrates and can be made relatively distortion free are used, with a laser produced plasma for the source. Higher resolution and/or larger areas are possible by varying the optic figures of the components and source characteristics. 7 figs.

0298 Solid State Circuitry with Optical Data Interfacing
D. H. Nhu
Department of the Navy, Washington, DC
Filed 9 Apr 90 9p
PAT-APPL-7-506 324 Available from NTIS: price code N03
A plurality of circuit chips with different data processing functions are interconnected by fiber optic interfacing to establish a solid state data handling system. Each circuit chip includes receiver and transmitter sections connected to the fiber optic interfacing to provide for conversion of signal data between optical and electrical formats. Patent applications.

Solid State Electrical Switch Employing Materials with Reversible Phase Transistors
See 0247

Systolic VLSI Array for Implementing the Kalman Filter Algorithm
See 0177

0299 Thin-Film Integrated Injection Logic
G. A. Garcia, R. E. Reedy
Department of the Navy, Washington, DC
Filed 18 Apr 88, patented 27 Jun 89 13p
PATENT-4 843 448 Available from Comm. of Patents
An integrated injection logic device formed on an insulating substrate is discussed. A lateral, load transistor and an adjacent, vertical switching transistor are formed in the semiconductor layer such that the collector region of the lateral transistor coincides with the base region of the switching transistor. The emitter of the switching transistor is located at the surface of the semiconductor injecting carriers downward into the collector. Isolated multiple collector contacts required for wired-AND logic are obtained by using separate Schottky-barrier contacts for each collector output. Patents.

0300 Universal Nondestructive mm-Wave Integrated Circuit Test Fixture
R. R. Romanofsky, K. A. Shalkhauser
National Aeronautics and Space Administration, Cleveland, OH. Lewis Research Center
Filed 10 Aug 89 17p
PAT-APPL-7-392 239 Available from NTIS: price code N03
Monolithic microwave integrated circuit (MMIC) test includes a bias module having spring-loaded contacts which electrically engage member. RF frequency is applied to and passed from the chip carrier by chamfered edges of ridges in the waveguide passages of housings which are removably attached to the base member. Thru, Delay, and Short calibration standards having dimensions identical to those of the chip carrier assure accuracy and reliability of the test. The MMIC chip fits in an opening in the chip carrier with the boundaries of the MMIC lying on movable reference planes thereby establishing accuracy and flexibility.

VLSI Single-Chip (255,223) Reed-Solomon Encoder with Interleaver
See 0153

X-Ray Source for Lithography
See 0494

ELECTROTECHNOLOGY: Other

0301 Actuator Rate Saturation Compensator
S. T. Donley, G. L. Gross, J. L. Koper
Department of the Navy, Washington, DC
Filed 5 May 88, patented 12 Sep 89 6p
PATENT-4 866 361 Available from Comm. of Patents
A device for compensating for actuator rate saturation is disclosed. The device is an improvement to a servomechanism of the type wherein a command signal and a position feedback signal from a member being positioned are summed to produce an error signal for driving an actuator to position the member in accordance therewith. The improvement is a means for inverting the error signal when the ratio of the slope of the plot of the position feedback signal versus time to the slope of the plot of the command signal versus time is less than one and the polarity of the error signal is opposite to the polarity of the slope of the command signal, and the absolute value of the error signal is not increasing. Application of the invention to the flight controls of an aircraft is disclosed. Patents.

0302 All-Fiber SFPM (Stimulated Four Photon Mixing) Amplifier
T. C. Stamnitz, S. D. Russell
Department of the Navy, Washington, DC
Filed 31 Aug 88, patented 19 Sep 89 7p
PATENT-4 867 518 Available from Comm. of Patents
An 'integrated fiber' device provides optical signal amplification to: 1) provide for increased distances between undersea repeaters and/or optical regeneration nodes in fiber optic transmission systems, or 2) support an increased number of multiple users on an optical data bus network or multiple parallel signal processing channels in an optical processor/computer. In the latter case a greater number of divisions of the signal can occur before the divided signal amplitude falls below the threshold needed for processing or detection. A combination of fiber components is incorporated that include: 2 optically tapered portions for conditioning of 2 input laser beams to a wavelength selective single-mode coupler used to combine the concentrated information signal and concentrated pump wave, and one of whose output ports is then optically coupled to a predetermined length of single-mode fiber. The fibers optogeometric parameters are especially designed for intrinsic phase-matching to effect pump wave frequency conversion and signal amplification by the nonlinear optical SFPM process. The amplified signal light is coupled out of the especially designed SFPM fiber by a mode-field conditioning device enabling beam expansion, such that the output core diameter of the mode-field conditioner equals the core diameter of the single-mode fiber used in the transmission link. An important aspect of this patent is that it can be configured for field and/or undersea installation.

0303 Almond Test Body
A. K. Dominek, R. M. Wood, M. C. Gilreath
National Aeronautics and Space Administration, Hampton, VA. Langley Research Center
Filed 23 May 88, patented 28 Feb 89 4p
PATENT-4 809 003 Available from Comm. of Patents
The invention is an almond shaped test body for use in measuring the performance characteristics of microwave anechoic chambers and for use as a support for components undergoing radar cross-section measurements. The novel aspect of this invention is its shape, which produces a large dynamic scattered field over large angular regions

making the almond valuable for verifying the performance of microwave anechoic chambers. As a component mount, the almond exhibits a low return that does not perturb the measurement of the component and it simulates the backscatter characteristics of the component as if over an infinite ground plane.

0304 Alternating Gradient Photodetector
A. W. Overhauser, J. Maserjian
National Aeronautics and Space Administration, Pasadena, CA. Pasadena Office
Filed 5 Nov 87, patented 22 Aug 89 9p
PATENT-4 860 074 Available from Comm. of Patents
A far infrared (FIR) range responsive photodetector is disclosed. There is a substrate of degenerate germanium. A plurality of alternating impurity-band and high resistivity layers of germanium are disposed on the substrate. The impurity-band layers have a doping concentration therein sufficiently high to include donor bands which can release electrons upon impingement by FIR photons of energy hv greater than an energy gap epsilon. The high resistivity layers have a doping concentration therein sufficiently low as to not include conducting donor bands and are depleted of electrons. Metal contacts are provided for applying an electrical field across the substrate and the plurality of layers. In the preferred embodiment as shown, the substrate is degenerate n-type (N+ +) germanium; the impurity-band layers are n+ layers of germanium doped to approximately the low 10(exp 16)/cu cm range; and, the high resistivity layers are n-layers of germanium doped to a maximum of approximately 10(exp)/cu cm. Additionally, the impurity-band layers have a thickness less than a conduction-electron diffusion length in germanium and likely to be in the range of 0.1 to 1.0 micron, the plurality of impurity-bands is of a number such that the flux of FIR photons passing therethrough will be substantially totally absorbed therein, the thickness of the high resistivity layers is such compared to the voltage applied that the voltage drop in each the high resistivity layers controls the occurence of impact ionization in the impurity-band layers to a desired level.

0305 Analog Electronic Control Differential Transmitter
J. C. Gremillion, W. P. Huntley
Department of the Navy, Washington, DC
Filed 28 Apr 89, patented 6 Mar 90 12p
PATENT-4 906 909 Available from Comm. of Patents
A linear, analog, synchro control differential transmitter for implementing the common synchro CDX function whereby a scaled linear analog voltage is used as input instead of a mechanical shaft angular displacement. Alternate synchro functions of CT and CX that the invention implements are also disclosed. Patents.

Analog Frequency Modulated Laser Using Magnetostriction
See 0847

0306 Apparatus and Method for Minimizing Polarization-Induced Signal Fading in an Interferometric Fiber-Optic Sensor Using Input-Polarization Control
A. D. Kersey
Department of the Navy, Washington, DC
Filed 25 Jan 89, patented 30 Jan 90 12p
PATENT-4 897 543 Available from Comm. of Patents
An apparatus and method for minimizing polarization-induced signal fading in an interferometric fiber-optic sensor is disclosed. In a preferred embodiment of the invention, the polarization state of an input light beam is changed by a polarization controller as a function of first and second control signals applied to the controller. The input light beam with the changed polarization state is applied to the input of an interferometric fiber-optic sensor to form an interference pattern at its output. This interference pattern is photodetected to develop an electrical signal that has a peak-to-peak amplitude proportional to the visibility of the interference pattern. A control circuit is responsive to the electrical signal for controllably developing the first and second control signals to change the polarization state of the input light beam to maximize the peak-to-peak amplitude of the electrical signal, thereby minimizing the polarization-induced signal fading in the interferometric fiber-optic sensor. The electrical signal is also demodulated to produce an output signal that is proportional to the field being sensed by the interferometric fiber-optic sensor. Patents.

0307 Apparatus and Method for Minimizing Polarization-Induced Signal Fading in an Interferometric Fiber-Optic Sensor Using Input-Polarization Modulation
A. D. Kersey, M. J. Marrone
Department of the Navy, Washington, DC
Filed 21 Jul 89, patented 12 Jun 90 1p
PATENT-4 932 783 Available from Comm. of Patents
An apparatus for minimizing polarization-induced signal fading in an interferometric fiber-optic sensor is disclosed. The apparatus includes an optical source for providing an input light beam, a polarization modulator for modulating the state of polarization of the input light beam into at least three states represented by mutually perpendicular polarization vectors on a Poincare Sphere. The apparatus further includes means for conveying the input light beam with the at least three mutually perpendicular modulated states of polarization to the fiber-optic sensor, the interferometric fiber-optic sensor being responsive to the input light beam with modulated polarization states for developing an interference pattern output, wherein the interference pattern output has at least three visibilities corresponding to the input states of polarization. A photodetector is responsive to the interference pattern output for developing an electrical signal having at least three amplitudes corresponding to the at least three states of polarization. Patents.

Apparatus for Cooling Electronic Components in Aircraft
See 0393

0308 Apparatus for Cooling Electronic Components in Aircraft
F. E. Altoz, J. D. McClure
Department of the Navy, Washington, DC
Filed 25 Jan 89, patented 19 Jun 90 1p
PATENT-4 934 154 Available from Comm. of Patents
A ram air cooling system for cooling electronic components in an aircraft provides automatic switching from a high ram air speed cooling mode (ACM) to a low ram air speed cooling mode (RAM). The cooling system receives variable speed ram air during the flight of the aircraft and includes an automatically controlled valve for either directing high speed ram air to a precooling means prior to cooling the electronic components or directing low speed ram air directly to the electronic components without precooling. The automatically controlled valve is controlled by programmable logic module means for comparing the cooling efficien-

cy of the electronic components by precooled ram air with the cooling efficiency of the electronic components by the non-precooled ram air. The cooling efficiencies are calculated from temperature measurements of the ram air at several locations in the system of the invention. Preferably, the ram air cooling means is an air turbine which extracts energy from the ram air to drive a compressor that compresses and discharges heated air that exists from the housing for the electronic components after the ram air has performed its cooling function. Patents.

Apparatus for Generating Enhanced/Regenerative Bracket Decode Signals
See 0141

0309 Atmospheric Autorotating Imaging Device
J. D. Burke
National Aeronautics and Space Administration, Pasadena, CA. Pasadena Office
Filed 13 Jun 88, patented 12 Dec 89 7p
PATENT-4 886 222 Available from Comm. of Patents
This invention relates to a scanning imaging device for deployment in either terrestrial or extraterrestrial atmospheres. An object of the present invention is to provide an extremely simple device that, upon deployment in an atmospheric environment, automatically rotates without the use of a propulsion system. An image detector appropriately disposed therein scans a panoramic view with each rotation of the device. Data gathered by the image detector may be transmitted to a remote receiver. The present invention may be particularly useful in the exploration of, for example, the Martian surface. The novelty of the present invention resides in the ability of the device to scan an image without the use of any moving parts or the expenditure of fuel energy.

Balanced Bridge Feedback Control System
See 0156

0310 Birefringent corrugated waveguide
C. P. Moeller
General Atomics, San Diego, CA.; Department of Energy, Washington, DC
Filed 15 Feb 89 22p
PAT-APPL-7-310 555 Available from NTIS: price code A03
A corrugated waveguide having a circular bore and noncircularly symmetric corrugations, and preferably elliptical corrugations, provides birefringence for rotation of polarization in the HE(sub 11) mode. The corrugated waveguide may be fabricated by cutting circular grooves on a lathe in a cylindrical tube or rod of aluminium of a diameter suitable for the bore of the waveguide, and then cutting an approximation to ellipses for the corrugations using a cutting radius R(sub 0) from the bore axis that is greater than the bore radius, and then making two circular cuts using a radius R(sub 1) less than R(sub 0) at centers +b and (minus)b from the axis of the waveguide bore. Alternatively, stock for the mandrel may be formed with an elliptical transverse cross section, and then only the circular grooves need be cut on a lathe, leaving elliptical corrugations between the grooves. In either case, the mandrel is first electroplated and then dissolved leaving a corrugated waveguide with noncircularly symmetric waveguides. A transition waveguide is used that gradually varies from circular to elliptical corrugations to couple a circularly corrugated waveguide to an elliptically corrugated waveguide.

0311 Cable Tester
R. L. Rammage
Department of the Army, Washington, DC
Filed 15 Dec 89 13p
PAT-APPL-7-451 065 Available from NTIS: price code N03
This patent application discloses a device for sequentially testing the plurality of connectors in a wiring harness. The harness is attached to the tester and a rotary switch is used to sequentially, individually test the connectors by passing a current through the connector. If the connector is unbroken, a light will flash to show it is electrically sound. Circuit testers.

0312 Calibrated Bender for Fiber Optic Cable Position Determination
W. Stevenson
Department of the Navy, Washington, DC
Filed 14 May 89, patented 26 Jun 90 6p
PATENT-4 936 675 Available from Comm. of Patents
Two sets of cylindrical fingers disposed in an interdigital relationship are pivoted together, scissors fashion, to receive a portion of an optical fiber cable. When the fingers are rotated to a closed position, they create a predetermined series of bends in the portion of the optical fiber cable that can be observed by an optical time domain reflectometer. This observation allows a remote monitor to determine the relative location of the bends with respect to a suspected break or other anomaly in the optical fiber cable so that a maintenance or repair crew can go directly to the location of the anomaly for quick action. Patents.

0313 Cerenkov Electrooptic Shutter
F. Hartemann, G. Bekefi
Department of the Air Force, Washington, DC
Filed 1 Jul 87, patented 30 May 89 9p
PATENT-4 835 391 Available from Comm. of Patents
A system which couples Cerenkov emission with a gated electrooptic effect to allow viewing of Cerenkov radiation in sub nanosecond time-scales is disclosed. Cerenkov radiation is generated by transmitting an electron beam through a transparent medium with a high index of refraction. The Cerenkov radiation is then gated into a sample pulse of subband second duration by an electrooptic crystal which has an index of refraction controlled by an electric field. The electric crystal is opaque to the Cerenkov radiation until receiving a 6.0 kV voltage for about 750 picoseconds, upon which a pulsed sample of Cerenkov radiation is transmitted to a display system. Patents.

0314 Coaxial Probe for Measuring the Current Density Profile of Intense Electron Beams
R. Florito, M. Raleigh
Department of the Navy, Washington, DC
Filed 19 Jun 84, patented 16 Dec 86 6p
PATENT-4 629 975 Available from Comm. of Patents
An interceptive type electric probe for mapping the radial current density profile of high energy and high current electron beams comprises an input sensor, an interface support connector and an output support connector. The entire structure of the electric probe is configured to closely approximate a coaxial transmission line of a predetermined impedance that is opened ended but yet shielded. The nature of the construction of the probe, in terms of material and techniques, allows for survival thereof in high temperature and intense beam environments. Keywords: Patents; Coaxial cables.

0315 Command Operated Liquid Metal Opening Switch
J. M. Gruden
Department of the Air Force, Washington, DC
Filed 13 Oct 87, patented 27 Jun 89 11p
PATENT-4 841 834 Available from Comm. of Patents
A very low inductance, very low resistance, command operated repetitive high current opening switch is described which uses a Lorentz force to move a conductive liquid between a conducting region and an insulated region between two electrodes. In a specific embodiment, a cylindrical outer electrode coaxially surrounds in a spaced relationship a generally cylindrical inner electrode. The annular space between the inner and outer electrodes is divided into first and second sections along the length of the electrodes. Intermeshing continuous spiral fins are defined on the facing surfaces of the inner and outer electrodes surrounding the second section. An electrically conductive liquid is sealed inside the first and second annular sections in an amount sufficient to substantially fill only one of the annular sections, so that electric current can flow between the outer electrode and the inner electrode through the liquid whenever any of the liquid is inside the first annular section, but the insulation prevents the flow of electric current flow between the outer electrode and the inner electrode when all of the liquid is inside the second annular section. Patents.

Coupled Strip Line Circuit
See 0215

0316 Device for Regulating Luminous Flux of Battery Powered Headlamp
D. S. Gasvoda
Forest Service, Washington, DC
Filed 1 Feb 89, patented 14 Aug 90 1p
PATENT-4 949 014 Available from Comm. of Patents
A low cost, highly efficient, lightweight device regulates the luminous flux output of an incandescent headlamp as its battery supply voltage changes. The device maintains nearly constant output and allows nearly all of the energy capacity of the battery to be utilized. The device makes practical the use of low cost, readily available batteries to power wild land firefighter's headlamps. The output of an unregulated headlamp diminishes rapidly as the batteries discharge.

Differential Polarimetric Fiber Optic Sensor
See 0853

0317 Digital color representation
J. M. White, V. Faber, J. S. Saltzman
Los Alamos National Lab., NM.; Department of Energy, Washington, DC
Filed 12 May 89 19p
PAT-APPL-7-350 675 Available from NTIS: price code A03
An image population having a large number of attributes is processed to form a display population with a predetermined smaller number of attributes which represent the larger number of attributes. In a particular application, the color values in an image are compressed for storage in a discrete lookup table (LUT) where an 8-bit data signal is enabled to form a display of 24-bit color values. The LUT is formed in a sampling and averaging process from the image color values with no requirement to define discrete Voronoi regions for color compression. Image color values are assigned 8-bit pointers to their closest LUT value whereby data processing requires only the 8-bit pointer value to provide 24-bit color values from the LUT. 4 figs.

0318 Discontinuous-Taper Directional Coupler,
G. L. Millican, J. A. Mosko
Department of the Navy, Washington, DC
Filed 26 May 83, patented 12 Apr 88 9p
PATENT-4 737 740 Available from Comm. of Patents
A stripline coupler exhibiting higher coupling coefficients and improved scattering properties in the plus 10 Ghz range, utilizes a section of discrete areal dimension in each of two tapered striplines, such that said sections form a discontinuity in the taper, in conjunction with perforations of the bilateral ground planes coincident with each section. The dielectric separating each stripline from the ground plane is modified in the region of the perforations to reduce the dielectric constant in the region. Patents.

0319 Dual Capability Piezoelectric Shaker
A. A. Sheridan
Department of the Navy, Washington, DC
Filed 22 Nov 83, patented 22 Jan 85 5p
PATENT-4 495 433 Available from Comm. of Patents
This patent discloses a shaker for performing both absolute and comparison accelerometer calibration. A reference accelerometer is mounted within or attached to a shaker head and calibrated with the shaker head by an absolute method. The shaker, thus calibrated absolutely, becomes a portable device for performing comparison calibrations on other accelerators which can be mounted on its shaker head.

0320 Dual Cathode System for Electron Beam Instruments
J. G. Bradley, J. M. Conley, D. B. Wittry
National Aeronautics and Space Administration, Pasadena, CA. Pasadena Office
Filed 11 Aug 87, patented 11 Jul 89 9p
PATENT-4 847 502 Available from Comm. of Patents
An electron beam source having a single electron optical axis is provided with two coplanar cathodes equally spaced on opposite sides from the electron optical axis. A switch permits selecting either cathode, and a deflection system comprised of electromagnets, each with separate pole pieces equally spaced from the plane of the cathodes and electron optical axis, first deflects the electron beam from a selected cathode toward the electron optical axis, and then in an opposite direction into convergence with the electron optical axis. The result is that the electron beam from one selected cathode undergoes a sigmoid deflection in two opposite directions, like the letter S, with the sigmoid deflection of each being a mirror image of the other.

0321 Electron Beam Apparatus for Testing Infrared Detectors in a Cryogenically Shielded Environment
L. D. Flesner, W. L. Eisenman, J. D. Merriam, R. L. Bates, R. N. Dahle
Department of the Navy, Washington, DC
Filed 8 Dec 88, patented 29 May 90 8p
PATENT-4 929 831 Available from Comm. of Patents
An apparatus for testing infrared detectors in response to a selectively controlled electron beam within a cryogenically shielded environment includes a cryostat having an aperture which is positioned adjacent to a scanning electron microscope. An electron beam emitted from the microscope propagates through the aperture to illuminate an infrared detector mounted within the cryostat so that the detector

can be tested in an environment substantially free of spurious infrared radiation. Patents.

Electronic Precipitator Control
See 0451

0322 Fast Optical Switch and Limiter Using Quantum Size Effect in Metal Grain Composites
J. W. Haus, N. Kalyaniwalla, R. Inguva, C. M. Rowden
Department of the Army, Washington, DC
Filed 7 Aug 89 10p
PAT-APPL-7-392 866 Available from NTIS: price code N03
A block of composite material includes a dielectric material with a dielectric constant of epsilon sub d = 4.66 and which is at least 4 micrometers thick and has electrically conductive microparticles randomly distributed throughout. The composite material exhibits an optical bistability without cavity feedback. The microparticles must be nearly uniform in size and of spherical diameter much smaller than the wavelength of light in the particle. The composite, when illuminated by laser light in the range of 500 nm and of varying intensity, becomes opaque at a critical input intensity and stays opaque until the input intensity reaches a certain level both below and above the intensity at which it initially became opaque. Thus the material behaves as an optical switch and a limiter. Patent applications.

0323 Ferroelectric Optical Switching
D. M. Gookin
Department of the Navy, Washington, DC
Filed 2 Mar 87, patented 15 Nov 88 9p
PATENT-4 784 473 Available from Comm. of Patents
A switchable optical element uses solution grown barium titanate or other photorefractive ferroelectric materials. A polarity reversible electric field is applied to electrodes on the crystal. Light beams each with a component that is orthogonal to the crystal c axis are passed through the crystals. By selectively reversing the polarity of the electric field, the switching of the power from one of the light beams to the other light beams is accomplished. Patents.

0324 Fiber Optic Frequency Transfer Link
L. Primas, R. Sydnor, G. Lutes
National Aeronautics and Space Administration, Pasadena, CA. Pasadena Office
Filed 31 May 89 22p
PAT-APPL-7-359 801 Available from NTIS: price code A03
A reference frequency distribution system is disclosed for transmitting a reference frequency from a reference unit to a remote unit while keeping the reference frequency at the reference unit and the remote unit in phase. A fiber optic cable connects the reference unit to the remote unit. A frequency source at the reference unit produces a reference frequency having an adjustable phase. A fiber optic transmitter at the reference unit modulates a light beam with the reference frequency and transmits the light beam into the fiber optic cable. A 50/50 reflector at the remote unit reflects a first portion of the light beam from the reference unit back into the fiber optic cable to the reference unit. A first fiber optic receiver disposed at the remote unit receives a second portion of the light beam and demodulates the reference frequency to be used at the remote unit. A second fiber optic receiver disposed at the reference unit receives the first portion of the light beam and demodulates a reference frequency component. A phase conjugator is connected to the frequency source for comparing the phase of the reference frequency component to the phase of the reference frequency modulating the light beam being transmitted from the reference unit to maintain a conjugate (anti-symmetric) relationship between the reference frequency component and the reference frequency modulating the light beam where virtually no phase difference exists between the phase of the reference frequency component and the phase of the reference frequency modulating the light beam.

0325 Fiber Optic Transversal Filter/Variable Delay Line
W. K. Burns
Department of the Navy, Washington, DC
Filed 13 Sep 89 24p
PAT-APPL-7-406 440 Available from NTIS: price code N03
An optical transversal filter comprises a plurality of optically power splitting devices, e.g., 3 x 3 single mode optical couplers, interspersed with fiber optical delay segments. In a n-column system the number of optical couplers in each column is given by the progression, 1,3,9...3(n-1st power) and only two different lengths of the fiber optic delay segments are required. Fiber optic delay segments of the appropriate delays are connected to the three outputs of each of the couplers such that the fiber optic delay segments connected to the last column provide 3 to the nth power taps. The outputs can be combined on a single fiber and multiple inputs can be used. Variable weight output taps are provided by connecting each output to an optical intensity modulator or switch. Patent applications.

0326 Field Induced Gap Infrared Detector
C. T. Elliott
National Aeronautics and Space Administration, Pasadena, CA. Pasadena Office
Filed 21 Jun 89 27p
PAT-APPL-7-369 403 Available from NTIS: price code A03
A tunable infrared detector which employs a vanishing band gap semi-metal material provided with an induced band gap by a magnetic field to allow intrinsic semiconductor type infrared detection capabilities is disclosed. The semi-metal material may thus operate as a semiconductor type detector with a wavelength sensitivity corresponding to the induced band gap in a preferred embodiment of a diode structure. Preferred semi-metal materials include Hg(1-x)Cd(x)Te, x is less than 0.15, HgCdSe, BiSb, alpha-Sn, HgMgTe, HgMnTe, HgZnTe, HgMnSe, HgMgSe, and HgZnSe. The magnetic field induces a band gap in the semi-metal material proportional to the strength of the magnetic field allowing tunable detection cutoff wavelengths. For an applied magnetic field from 5 to 10 tesla, the wavelength detection cutoff will be in the range of 20 to 50 micrometers for Hg(1-x)Cd(x)Te alloys with x about 0.15. A similar approach may also be employed to generate infrared energy in a desired band gap and then operating the structure in a light emitting diode or semiconductor laser type of configuration.

0327 Frequency Independent Constant Beamwidth Directional Lens Antenna for Very Wideband and Multi-Channel Electromagnetic Communications
R. L. Sternberg
Department of the Navy, Washington, DC
Filed 7 Jul 88, patented 11 Jul 89 5p
PATENT-4 847 628 Available from Comm. of Patents
A frequency independent constant beamwidth lens antenna concept is described utilizing a point source to point focus

nonspherical lens. The essential feature is that a twisted planar or hyperbolic paraboloidal phase or wave front is formed by the antenna which then in turn produces a frequency independent constant beamwidth beam in the far field of the antenna for radiation or reception of planar or nearly planar spherical waves. Moreover, the frequency independent constant beamwidth beam may be steered or scanned in azimuth without moving the lens antenna or a plurality of fixed beams in different directions may be formed simultaneously by the lens antenna. Patents.

0328 High Power, High Sensitivity Microwave Calorimeter
F. M. Mako, J. A. Pasour
Department of the Navy, Washington, DC
Filed 22 May 89 18p
PAT-APPL-7-354 559 Available from NTIS: price code N03
A microwave calorimeter is disclosed for substantially measuring the total microwave energy in an applied microwave pulse. The microwave calorimeter includes: a housing having a highly reflective interior surface, a microwave device disposed in the housing for substantially absorbing microwave energy transmitted into the housing and for producing a thermal response proportional to the amount of microwave energy being absorbed, and a measurement device responsive to the thermal response for the determining the amount of microwave energy being absorbed by the microwave absorbing device. Patent applications.

High Power, Solid State RF Pulse Generators
See 0222

High Temperature Electric Arc Furnace and Method
See 0499

0329 Improved Electrical Cable for Vehicles
J. W. Monroe
Department of the Army, Washington, DC
Filed 12 Oct 89 13p
PAT-APPL-7-420 801 Available from NTIS: price code N03
This patent application discloses an improved cable for connecting electrical components inside a combat vehicle, the cable being comprised of a plurality of tubes surrounding individual wire bundles inside the cable. The tubes are resistant to diametrical crushing and have low-friction outer diametrical surfaces to facilitate relative axial sliding between the tubes. When the combat vehicle is being electrically repaired or updated, damaged or obsolete wire bundles can be slid out of the tubes and new wire bundles can thereafter be slid into the vacant tube. Electric connectors; Electric cables; Tanks combat vehicles.

0330 In-line rotating torque sensor with on-board amplifier background of the invention
J. W. Kronberg
Du Pont de Nemours (E.I.) and Co., Aiken, SC.; Department of Energy, Washington, DC
Filed 13 Jun 89 21p
PAT-APPL-7-365 342 Available from NTIS: price code A03
A rotating torque sensor apparatus and method for measuring small torques comprising a shaft, a platform having a circuit board and a first moment arm attached to the shaft, a rotatable wheel coaxial with the shaft and having a second moment arm spaced apart from the first moment arm with a load cell therebetween for generating an electric signal as the torque is applied to the shaft and transferred through the moment arms to the load cell. The electrical signal is conducted from the load cell tc the circuit board for filtering and amplification before being extracted from the torque assembly through a slip ring.

0331 Induction-Type Metal Detector with Increased Scanning Area Capability
E. S. Lesky, A. J. Reid, W. E. Bushong, D. P. Dickey
National Aeronautics and Space Administration, Cocoa Beach, FL. John F. Kennedy Space Center
Filed 28 Oct 88, patented 27 Mar 90 11p
PATENT-4 912 414 Available from Comm. of Patents
A metal detector includes a detector head having a primary or transmit coil for the transmission of electromagnetic radiation and having a plurality of secondary or receiving coils associated for having voltages induced by transmissions from the primary coil. The presence of metallic objects within the detector head affects the voltage level induced in the secondary coils, a condition which may be detected as indicative of such presence of metallic objects. Each detector head preferably includes a primary coil about the periphery, with a plurality of secondary coils, all in the same plane with the primary coil, situated axially in from the periphery of the detector head in a mutually non-overlapping configuration, preferably about the center of such detector head. A plurality of such detector heads may be supported in coplanar alignment by a common non-metallic support structure for scanning relatively larger areas at a time. The primary coil of each respective detector head may be sequentially pulsed and selectively spaced to avoid interference with adjacent detector heads, thereby avoiding certain inherent disadvantages in applying conventional single detector head frequency-dependent tuned coil technology to multiple head use in an integral metal detector system.

0332 Infrared Fiber-Optical Temperature Sensor
J. E. Bryant, J. E. Bennett, W. H. Pinkston
Department of the Navy, Washington, DC
Filed 23 Mar 90 17p
PAT-APPL-7-501 996 Available from NTIS: price code N03
A temperature sensor comprising a probe, infrared fibers, super cooled detectors and their associated electronics, and a computer for determining the temperature from the output of the electronics. Photons from a heat source are collected by the infrared fibers and transmitted to the detectors amplifier unit where they are detected and amplified by the electronics. A voltage is then outputted which represents measured temperature. The voltage is sampled by the computer where it is converted to temperature by use of computer algorithms. Patent applications.

Input/Output Bus Interface Background of the Invention
See 0166

0333 Internal Transmission Line Filter Element
A. R. Hislop
Department of the Navy, Washington, DC
Filed 27 Jun 86, patented 10 Oct 89 6p
PATENT-4 873 501 Available from Comm. of Patents
An improved transmission line filter element allows a higher difference between even and odd mode impedances than previously obtainable from planar structures. The filter element comprises a U-shaped gap formed in the strip conductor of a strip line transmission line, a microstrip structure or a suspended strip line structure. The internal transmission line filters can be cascaded to produce electromagnetic energy filters with deeper notches and steeper skirts

than previously obtainable from other planar structures with the same number of elements. Patents.

Laser Communication System With Wide Band Magnetostrictive Modulation
See 0148

0334 Laser Detection and Discrimination System
K. Charkrabarti, V. K. Mathur, G. P. Summers
Department of the Navy, Washington, DC
Filed 16 Aug 89 15p
PAT-APPL-7-394 457 Available from NTIS: price code N03

Magnesium oxide sensing material is pretreated and charged by UV radiation to identify impingement thereon of radiation from a near infrared laser source by detection of blue emissions which persist for an unusually long period of time, avoiding frequent respotting and recharging. When heated to thermoluminescence peaks above room temperature by irradiation from a far infrared laser source, the magnesium oxide exhibits green luminescence enabling wavelength discrimination between detection of near and far infrared laser sources. Such pretreated magnesium oxide also produces green emissions when irradiated by UV laser sources, to distinguish between detection of the UV laser sources and the far infrared laser sources by discrimination between different fading behaviors of the green emissions. Patent applications.

0335 Liquid Crystal Fiber Optics Large Screen Display Panel
P. Soltan, P. C. Fletcher
Department of the Navy, Washington, DC
Filed 27 Jun 79, patented 10 Nov 81 8p
PATENT-4 299 447 Available from Comm. of Patents

A display screen shows a number of alphanumeric characters in accordance with computer originating signals. These signals are fed to a liquid crystal panel which responsively varies its opacity and, preferably, tapered fiber optics extend from one side of the liquid crystal panel to the screen. In one mode light originating from a high intensity source behind the screen is transmitted through the fiber optics. In another mode light from the front of the screen is reflected from a reflector surface behind the liquid crystal panel to the display screen. Either mode of operation allows the fabrication of a matrix of a number of liquid crystal panels and their associated fiber optics to provide an expanded display screen. Thus, an expanded visual presentation is read out from a computer or similar source of controlling signals to assure that several observers are reliably informed. Patents.

0336 Long wavelength, high gain InAsSb strained-layer superlattice photoconductive detectors
R. M. Biefeld, L. R. Dawson, I. J. Fritz, S. R. Kurtz, T. E. Zipperian
Sandia National Labs., Albuquerque, NM.; Department of Energy, Washington, DC
Filed 12 May 89 15p
PAT-APPL-7-350 814 Available from NTIS: price code A03

A high gain photoconductive device for 8 to 12 (mu)m wavelength radiation including an active semiconductor region extending from a substrate to an exposed face, the region comprising a strained-layer superlattice of alternating layers of two different InAs(sub 1-x)Sb(sub x) compounds having x (ge) 0.75. A pair of spaced electrodes are provided on the exposed face, and changes in 8 to 12 (mu)m radiation on the exposed face cause a large photoconductive gain between the spaced electrodes. 9 figs.

0337 Long Wavelength Infrared Detector
R. P. Vasquez
National Aeronautics and Space Administration, Pasadena, CA. Pasadena Office
Filed 12 Dec 88 13p
PAT-APPL-7-283 443 Available from NTIS: price code A03

Long wavelength infrared detection is achieved by a detector made with layers of quantum well material bounded on each side by barrier material to form paired quantum wells, each quantum well having a single energy level. The width and depth of the paired quantum wells, and the spacing between, are selected to split the single energy level with an upper energy level near the top of the energy wells. The spacing is selected for splitting the single energy level into two energy levels with a difference between levels sufficiently small for detection of infrared radiation of a desired wavelength.

0338 Long Wavelength Infrared Detector with Heterojunction
T. K. Chu
Department of the Navy, Washington, DC
Filed 18 Jun 90 9p
PAT-APPL-7-539 958 Available from NTIS: price code N03

An infrared radiation detector having a first semiconductor layer deposited on a substrate to form a diode junction with an overlay contact, is rendered more effective to detect long wavelength radiation by deposit of a second semiconductor layer between the first layer and the overlay contact in a heterojunction arrangement. The semiconductor materials are selected so as to separate radiation absorbing and electrical functions respectively performed within the two layers and to produce an enhanced output across the diode junction between the first layer and the overlay contact. Patent applications.

Low Force Cable Disconnect
See 0520

0339 Low Loss Electro-Optic Modulator Mount
R. E. Belek, R. J. Mongeon, L. M. Laughman
Department of the Air Force, Washington, DC
Filed 21 Aug 84, patented 18 Jul 89 5p
PATENT-4 849 719 Available from Comm. of Patents

The crystal is solid CdTe or GaAs for modulating a laser beam. The mount comprises Al2O3 or BeO ceramic between the crystal and a U-shaped aluminum housing on three sides to provide low stray capacitance and high thermal conductivity to the cooled housing. A layer of lead between the ceramic and the housing enhances the acoustic damping of the structure. Electrodes are attached to the crystal, with lead used to enhanced dissipation of acoustic energy. In contacting flexible tabs on the electrodes with terminals no pressure or stress is transmitted to the crystal, thereby eliminating a problem of stress-induced birefringence. (Patents).

0340 Magnetic Amplifier Housing and Detector for an Improved Tamper Alarm System
M. M. Evans, R. V. Kruchowy
Department of the Navy, Washington, DC
Filed 17 Jun 88, patented 12 Sep 89 6p
PATENT-4 866 426 Available from Comm. of Patents

A magnetic amplifier housing uses a base, dowel and shunt to magnetizable material to concentrate the magnetic field of a ring magnet through a Hall Effect transistor to provide an improved detector device with increased gain. The detector device cause polarity reversal when tampered with, ensures positive mechanical alignment of the transistor and mechanical components, and protection of the transistor from mechanical damage. Patents.

Method and Apparatus for Determining Optical Absorption and Emission Characteristics of a Crystal or Non-Crystalline Fiber
See 0866

0341 Method and apparatus for making multistrand superconducting cable
J. M. Royet, R. A. Armer
Lawrence Berkeley Lab., CA.; Department of Energy, Washington, DC
Filed 14 Mar 89 17p
PAT-APPL-7-322 875 Available from NTIS: price code A03
Improved multistrand Rutherford-type superconducting cable is produced in a flattened form with two layers of helically wound strands and in which the strands are alternately twisted about their lengths equally and in opposite directions to provide a flat cable with improved stability. In particular, the cable is made by guiding multifilament wire strands from spools on a rotating turret to a fixed tapered forming mandrel where they are wound diagonally around the mandrel and then rolled into a flattened shape. The spools are located around the periphery of turret and are rotatable about axes in a plane parallel to the turret to unroll the wire.

Method and Apparatus to Enhance the Sensitivity of Cylindrical Magnetostrictive Transducer to Magnetic Fields
See 0263

Method for Detecting Pinholes and Incomplete Coverage of Hermetic Coatings on Optical Fiber Waveguides
See 0871

0342 Method for Fabricating Thin Film Metallic Meshes for Use as Fabry-Perot Interferometer Elements, Filters and Other Devices
C. J. Taylor, J. Grossman, J. Fischer, H. A. Smith, M. C. Peckerar
Department of the Navy, Washington, DC
Filed 21 Jul 87, patented 4 Apr 89 11p
PATENT-4 818 661 Available from Comm. of Patents
A method of fabricating a free-standing wire mesh grid pattern having a smooth, flat surface is disclosed. A thermal oxide is selectively applied to front and back sides of a silicon substrate. A central portion of the oxide on the back side is removed. A resist layer is applied onto the oxide on the front side of the substrate. A resist mesh pattern with a border encompassing that resist mesh pattern is lithographically developed on the resist layer. Chrome and gold layers are sequentially deposited onto the border and into the resist mesh pattern to create a wire mesh pattern within the resist mesh pattern. The resist layer, including the developed resist mesh pattern, is removed to expose the wire mesh pattern from the front side of the substrate. A nickel layer is deposited over the gold layer to developed a wider wire mesh pattern. A second gold layer is then deposited over the nickel layer to form a wire mesh grid pattern composed of chrome, gold, nickel and gold layer. Patents.

Method of Controlling Discharge of Stored Electric Charge in Plastic Objects and Forming Lichtenberg Figures in Plastic Objects
See 0912

0343 Method of Forming Low Cost, Formable High T(Subc) Superconducting Wire
J. L. Smialek
National Aeronautics and Space Administration, Cleveland, OH. Lewis Research Center
Filed 28 Dec 89 9p
PAT-APPL-7-458 467 Available from NTIS: price code N03
A ceramic superconductivity part, such as a wire, is produced through the partial oxidation of a specially formulated copper alloy in a core. The alloys contains low level of quantities of rare earth and alkaline earth dopant elements. Upon oxidation at high temperatures, and superconducting oxide phases are formed as a thin film.

0344 Method of Making a Cathode from Tungsten and Iridium Powders Using a Reaction Product from Reacting Barium Peroxide with an Excess of Tungsten as the Impregnant
L. E. Branovich, G. L. Freeman, B. Smith, D. W. Eckart
Department of the Army, Washington, DC
Filed 24 Aug 89 8p
PAT-APPL-7-401 202 Available from NTIS: price code A02
The general object of this invention is to provide an improved method of making a long life high current density cathode. A more particular object of the invention is to provide such a method that will be rapid and in which the resulting emission over a set time period will be sufficient. It has now been found that such a method can be provided by making such a cathode from a mixture of tungsten and iridium powders to form a porous billet and using a reaction product formed from reacting barium peroxide with an excess of tungsten as the impregnant for the porous billet. By an excess of tungsten is meant that the molar ratio of barium peroxide to tungsten in forming the impregnant is less than 3 to 1. Patent application.

0345 Method of Making a Cathode from Tungsten Powder
L. E. Branovich, B. Smith, G. L. Freeman, D. W. Eckart
Department of the Air Force, Washington, DC
Filed 22 Jan 90 8p
PAT-APPL-7-468 335 Available from NTIS: price code N03
This invention relates in general to a method of making a cathode for operation in microwave devices and in particular to a method of making a cathode for operation in microwave devices from tungsten powder using as an impregnant the product formed from adding about 1 mole of a member selected from the group consisting of zirconium, zirconium dioxide, hafnium, hafnium dioxide, uranium, uranium dioxide, titanium, and titanium dioxide to about 50 to about 100 moles of a compound selected from the group consisting of Ba3Al2O6, Ba3WO6, and Ba4Al2O7.

Method of Making a Long Life High Current Density Cathode from Tungsten and Iridium Powders Using a Mixture of Barium Peroxide and a Coated Emitter as the Impregnant
See 0580

0346 Method of Making a Long Life High Current Density Cathode from Tungsten and Iridium Powders Using a Quarternary Compound as the Impregnant
L. E. Branovich, B. Smith, G. L. Freeman, D. W. Eckart
Department of the Army, Washington, DC
Filed 2 Jan 90 8p
PAT-APPL-7-459 629 Available from NTIS: price code N03
A long life high current density cathode is made from a mixture of tungsten and iridium powders by processing the mixture of powders with an activator into a porous billet, and then impregnating the billet with a quaternary compound including barium, oxygen, a metal selected from the group consisting of osmium, iridium, rhodium, and rhenium, and a metal selected from the group consisting of strontium, calcium, scandium and titanium, by firing the billet in a dry hydrogen furnace at a temperature at which the impregnant melts. Patent applications.

0347 Method of Sensitizing Pb-Salt Epitaxial Films for Schottky Diodes
T. K. Chu, F. Santiago
Department of the Navy, Washington, DC
Filed 27 Jul 88, patented 1 Aug 89 7p
PATENT-4 853 339 Available from Comm. of Patents
This invention relates to photodetectors and more particularly to infrared-sensitive photodiodes. It is well established that single crystal films of lead chalcogenides, lead tin chalcogenides, and lead cadmium chalcogenides can be epitaxially grown on heated alkali metal halide substrates by vacuum evaporation. The chalcogenides used include the sulfides, selenides, tellurides, and mixtures thereof. The substrates are single crystals of infrared transparent alkali metal halides and alkaline earth halides. Examples include barium fluoride, strontium fluoride, calcium fluoride, lithium fluoride, sodium chloride, potassium chloride, etc. It is also well known that the vacuum deposition of a metal contact of certain materials such as lead or indium, on the surface of an epitaxial layer of a lead chalcogenide, lead tin chalcogenide, or lead cadmium chalcogenide creates a non-Ohmic Schottky barrier at the point of contact, resulting in an infrared sensitive photodiode. Patents.

0348 Method to Image High Speed Events Using a Standard Video Camera
S. M. Shepard
Department of the Army, Washington, DC
Filed 22 Jan 90 26p
PAT-APPL-7-468 336 Available from NTIS: price code N03
Disclosed is a method of imaging a high speed event wherein a multiplicity of frames, or image fields, are output from a camera scanning repeated occurrences of the event. Selected data representing lines from the raster patterns occurring during the event are accumulated in essentially random order. The selected data are used to construct a composite image of the high speed event. Patent applications.

0349 Microwave Transmission Line and Method of Modulating the Phase of a Signal Passed through Said Line
R. A. Neifeld
Department of the Air Force, Washington, DC
Filed 5 Feb 90 10p
PAT-APPL-7-474 976 Available from NTIS: price code N03
A microwave transmission line is provided including a class of dielectric materials known as relaxor dielectrics having very dielectric constants of greater than 1000, low dielectric loss and large variations of the real part of the dielectric constant with varying temperature. The phase of a microwave signal passed through such a transmission line is modulated by subjecting the transmission line to light that is absorbed in the dielectric layer causing a variation in the dielectric constant and a change in the velocity of the continuous microwave signal passing through the transmission line. Patent Applications.

0350 Miniature Traveling Wave Tube and Method of Making
H. G. Kosmahl
National Aeronautics and Space Administration, Cleveland, OH. Lewis Research Center
Filed 8 Dec 87, patented 26 Dec 89 8p
PATENT-4 890 036 Available from Comm. of Patents
A miniature traveling wave tube is provided which will have most of the advantages of solid state circuitry but with higher efficiency and without being highly sensitive to temperature and various types of electromagnetic radiation and subatomic particles as are solid state devices. The traveling wave tube is about 2.5 cm in length and includes a slow wave circuit (SWS) comprised of apertured fins with a top cover which is insulated from the fins by strips or rungs of electrically insulating, dielectric material. An extemely small SWS is constructed by employing various grooving and etching methods, and by providing insulating strips or rungs by various deposition and masking techniques.

Miniaturization of Flight Deflection Measurement System
See 0932

0351 Mode Field Conditioner
T. C. Stamnitz, S. D. Russell
Department of the Navy, Washington, DC
Filed 8 Sep 88, patented 3 Apr 90 7p
PATENT-4 913 507 Available from Comm. of Patents
The 'mode field conditioner' (MFC) includes a radially contracted region in a cylindrical dielectric waveguide wherein, optical power density undergoes transition from low to high values in order to stimulate or enhance certain nonlinear optical effects or combinations of nonlinear optical effects; i.e., frequency conversions, phase transitions, polarization changes, the magnitude of which changes are proportional to the precise degree of light concentration that takes place. An intrinsic transition from linear fiber optic links to nonlinear fiber optic links to nonlinear optical transmission lines or networks can be made by an appropriate concatenation or arrangement of one or more of the suitably designed mode field conditioners. The mode field of the transmitted light may be decreased corresponding to increase power density, a phase-shift may be induced via self-phase modulation, frequency conversion may occur via stimulated Raman scattering or stimulated four-photon mixing, temporal and/or spatial pulse shaping may occur via a combination of nonlinear effects, or a rotation in the polarization or a change from linear to circular polarization or vice versa. Patents.

Monolithic Laser Diode Structure for Microwave Generation
See 0875

0352 Monolithic Multichannel Detector Amplifier Arrays and Circuit
G. E. Anderson, J. B. Boos, D. I. Ma, I. A. Mack, N. A. Papanicolaou
Department of the Navy, Washington, DC
Filed 25 Oct 88, patented 8 May 90 7p
PATENT-4 924 285 Available from Comm. of Patents
An integrated planar, single-channel, photodetector-amplifier device is disclosed. The single-channel device includes a photodetector layer and an amplifier layer above the photodetector layer. The photodetector layer is low-doped to give a low dark current and is sufficiently thick to give a high quantum efficiency. The amplifier layer is of a smaller thickness and is more highly doped material than the photodetector layer, to provide an amplifier having high gain. An insulating layer is included between the photodetector and amplifier layers for electrically isolating the photodetector and amplifier layers. The layers are fabricated on a substrate. Isolation regions are also included for electrically laterally isolating a photodetector, amplifier, and other circuit components comprising the single channel device from each other. Keywords: Patents, PAT-CL-357-30.

0353 Multi-Color Coincident Infrared Detector Background of the Invention
T. K. Chu
Department of the Navy, Washington, DC
Filed 4 May 90 6p
PAT-APPL-7-519 064 Available from NTIS: price code N03
This invention relates generally to radiation sensing detectors and more particularly to detectors producing plural electrical outputs in response to impinging radiation at distinctly different wavelengths. The use of epitaxial semiconductors as infrared detectors in a multi-color imaging system, is generally well known. In such prior detector arrangements, photovoltages are developed across separate junctions respectively formed on the semiconductors having different bandgaps and on which separate optically active surfaces are established in order to achieve multi-color operation. Since each junction responds to only a spatial portion of the incident optical input, there is a loss of signal content. Further, when such detectors are arranged in an array configuration signal loss is especially severe because of non-coincident radiation focussed on separate areas at different times. Keywords: Patent applications.

0354 Multiband Photoconductive Detector Based on Layered Semiconductor Quantum Wells
S. G. Bishop, B. V. Shanabrook
Department of the Navy, Washington, DC
Filed 29 Jun 89 20p
PAT-APPL-7-372 961 Available from NTIS: price code N03
A multiband photoconductive detector and method for simultaneously and separately detecting and distinguishing light or radiation from a large number of different wavelength bands is disclosed. The multiband photoconductive detector comprises a plurality of low energy gap semiconductor layers of preselected progressively decreasing thicknesses of a first material, a plurality of high energy gap semiconductor layers of a second material interleaved with the plurality of low energy gap semiconductor layers, and a plurality of pairs of electrical contacts respectively applied to the plurality of low energy gap semiconductor layers and adapted to respectively receive associated bias voltages to enable the plurality of low energy gap semiconductor layers to constitute a corresponding plurality of separate photoconductive detectors with a preselected plurality of different wavelength bands. Keywords: Patent applications.

0355 Multichannel Fiber Optics Connector
R. L. Morency, L. D. Olin
Department of the Navy, Washington, DC
Filed 26 Aug 81, patented 21 Feb 84 4p
PATENT-4 432 603 Available from Comm. of Patents
A multichannel fiber optics connector comprises two virtually identical halves, each of which is made up of an insert alignment bushing, a shell and a clamping nut. The bushing has anchor and keying pins attached. The connector is waterproof and pressure tolerant for underwater use. Patents.

0356 Multicolor Infrared Photodetector
K. K. Choi
Department of the Army, Washington, DC
Filed 2 Apr 90 21p
PAT-APPL-7-503 015 Available from NTIS: price code N03
This patent application discloses a multicolor infrared detection device comprising a number of doped quantum well structural units. Each unit consists of a thick well and a thin well separated by a thin barrier. This agreement produces strong coupling. Infrared radiation incident on the device gives rise to intersubband absorption. For each transition of photosignal results which allows the detection of a plurality of incident frequencies. Keywords: Photodetectors; Patent applications; Infrared detection; Multicolor; Doped quantum well structural units; Intersubband absorption; Serial no. 07/503,015.

Narrow-Bandwidth Unstable Laser Resonator
See 0878

0357 Non-Volatile Memory Cell with Ferroelectric Capacitor Having Logically Inactive Electrode
L. J. Schwee
Department of the Navy, Washington, DC
Filed 6 Mar 90 13p
PAT-APPL-7-489 138 Available from NTIS: price code N03
This invention relates to improvements in non-volatile, self restoring memories as referred to and disclosed in my prior copending application, Serial No. 54,973, filed May 5, 1987, with respect to which the present application is a continuation-in-part. According to the disclosure in my aforementioned prior copending application, which is incorporated herein by reference, the top electrode plate of the capacitor in each of the cells of a ferroelectric memory array was logically active incontrolling capacitor polarization by a controlled supply of high and low voltages thereto. The logic drive circuitry necessary to control the supply of such different voltages to the top electrode plates of the capacitors in the memory cells, renders the associated memory array somewhat costly to manufacture and dimensionally extensive. Keywords: Patent applications.

OPFET (Optical Field-Effect Transistor) Demodulator-Downconverter for Detecting Microwave Modulated Optical Signals
See 0292

0358 Optical Arithmetic Logic Using the Modified Signed-Digit Redundant Number Representation
M. E. Lasher, R. P. Bocker, B. L. Drake, T. B. Henderson
Department of the Navy, Washington, DC
Filed 16 Jun 88, patented 5 Sep 89 25p
PATENT-4 863 247 Available from Comm. of Patents

Optical architectures are presented for performing fully parallel, carry-free computation with a trinary, modified signed-digit number representation to allow addition, subtraction and multiplication. Two different optical schemes involving position and polarization encoding enable the fabrication of modular trinary numbers of different magnitudes. The optical systems made up of redundant three-dimensional modules provide a designer with latitude to simultaneously carry out addition, subtraction or multiplication optically and with reduced complexity. Patents.

0359 Optical Beamformers
J. N. Lee, R. A. Athale, B. Rolsma
Department of the Navy, Washington, DC
Filed 12 Feb 88, patented 29 Aug 89 12p
PATENT-4 862 115 Available from Comm. of Patents
This patent discloses a beamforming system, particularly useful for seismic exploration or undersea surveillance, in which data processing of the system is done optically. Sensor outputs are subjected to plural sets of time delays, and the system beams formed optically. Four embodiments are presented of the optical processing hardware.

0360 Optical Communications System Having a Wide-Core Single-Mode Planar Waveguide
V. Provenzano, M. A. Imam, T. M. Tritt
Department of the Navy, Washington, DC
Filed 5 Jun 89 19p
PAT-APPL-7-361 078 Available from NTIS: price code N03
This invention concerns an optical communication system having a planar waveguide for a single-mode light wave; and, more particularly, it relates to an improved optical communication system having a unique single-mode wide-core planar waveguide of cladded and composite construction for propagating a single-mode light wave as the result of uniquely using more than one novel algorithmic technique that is based on inverse scattering theory and that analytically determines various design parameters of the waveguide prior to fabrication and use. Patent application.

0361 Optical Fiber for Magnetostrictive Responsive Detection of Magnetic Fields
A. Yariv, H. V. Winsor
Department of the Navy, Washington, DC
Filed 9 Jan 81, patented 21 Feb 84 14p
PATENT-4 433 291 Available from Comm. of Patents
An optical fiber cable and magnetic field detector magnetostrictively reactive to the presence of an external magnetic field are presented. The optical fiber cable comprises a elongated optically transparent core sheathed by a magnetostrictively responsive jacket disposed about the periphery of the core. The jacket responds to magnetic fields present and strains the core effecting the light transmissions of the core. The effect upon the light transmission by the jacket is detected by interferometry for determining the presence of the magnetic field. Patents.

0362 Optical Fiber-to-Channel Waveguide Coupler
D. J. Albares, D. B. Cavanaugh, T. W. Trask
Department of the Navy, Washington, DC
Filed 3 Mar 89, patented 5 Jun 90 1p
PATENT-4 930 854 Available from Comm. of Patents
A micromanipulator and UV curing adhesive allows a precise end-on coupling of an optical fiber to a film optical waveguide on a substrate. Such a coupling facilitates the optical processing of data on active or passive optoelectronic chips with the inherent advantages of parallel, high speed capability. After coarse alignment by suitability arranging the chips, each fiber is cemented into an etched V-groove in its Si chip with a UV curing adhesive for coarse positioning and mechanical support a few millimeters away from the waveguide chip. A precision fine alignment of each fiber is assured by the micromanipulator which displaces a hypodermic needle-like chuck to align the fiber with the waveguide. The fiber is finally cemented in place by the curing of a small amount of the UV curable adhesive that is coated on its end. Patents.

0363 Optical High-Speed Parallel Backplane
A. J. Corda
Department of the Navy, Washington, DC
Filed 29 Jan 90 12p
PAT-APPL-7-471 316 Available from NTIS: price code N03
An optical backplane is for use in a high-speed, parallel signal processing system. A plurality of circular shaped optical conductors are arranged in a cylindrical topology. A plurality of printed circuit card connectors are disposed radially about the perimeter of the optical conductors. Each connector consists of a linear array of optical transceivers. The lens of each optical transceiver is mounted in a socket provided at the perimeter of each optical conductor. The optical transceivers convert electrical data information from printed circuit boards plugged into the circuit card connectors into optical data information. The optical data information propagates throughout the optical conductor thereby allowing data to be shared by the printed circuit boards. Patent applications.

0364 Optical Phase Conjugate Beam Modulator and Method Therefor
L. S. Ditman
Department of the Navy, Washington, DC
Filed 1 Sep 88, patented 1 May 90 6p
PATENT-4 921 335 Available from Comm. of Patents
The present invention relates to the modulation of a phase conjugate beam. A writing beam is directed incident to phase conjugate reflector. A modulating beam is also directed incident to the phase conjugate reflector for amplitude modulation of the phase conjugate beam. The modulating beam can also be steerable for effecting the amplitude of the phase conjugate beam according to spatial distribution so as to spatially modulate the phase conjugate beam. The phase conjugate modulation thus can be accomplished by opto-optical means and without modulation of or effect on the incident writing beam. Keywords: Patents, PAT-CL-350-354.

Optical Shutter Switching Matrix
See 0149

0365 Opto-Electronic Vivaldi Transceiver
A. P. DeFonzo
Department of the Air Force, Washington, DC
Filed 26 Feb 88, patented 8 Aug 89 8p
PATENT-4 855 749 Available from Comm. of Patents
A planar integrated opto-electronic transceiver apparatus having a pair of broadband tapered slot line antennas which are monolithically integrated on an ion implanted silicon on sapphire substrate. An optical pulse which is applied to the narrow slot of the transmitting antenna, generates an electromagnetic transient to the antenna aperture from which it is radiated to receiver slot line antenna. The received electromagnetic transient is detected at the narrow slot and is time resolved by an optical sampling signal. Patents.

0366 Passive Stabilization of a Fiber Optic Nonlinear Interferometric Sensor
K. P. Koo, F. Bucholtz, A. Dandridge
Department of the Navy, Washington, DC
Filed 20 May 88, patented 21 Nov 89 9p
PATENT-4 881 813 Available from Comm. of Patents
Three sampling circuits, a subtraction circuit, and a divider circuit cooperate to sample an output signal from a nonlinear interferometric sensor at proper times, to subtract output signal samples to obtain a difference signal, and to divide an output signal sample into the difference signal to remove noise-induced modulation from the output signal. Patents.

0367 Permanent Magnet Flux-Biased Magnetic Actuator with Flux Feedback
N. J. Groom
National Aeronautics and Space Administration, Hampton, VA. Langley Research Center
Filed 11 Sep 89 17p
PAT-APPL-7-405 168 Available from NTIS: price code N03
The invention is a permanent magnet flux-biased magnetic actuator with flux feedback for adjustably suspending an element on a single axis. The magnetic actuator includes a pair of opposing electromagnets and provides bi-directional forces along the single axis to the suspended element. Permanent magnets in flux feedback loops from the opposing electromagnets establish a reference permanent magnet flux-bias to linearize the force characteristics of the electromagnets to extend the linear range of the actuator without the need for continuous bias currents in the electromagnets.

0368 Power Transmission Device
W. F. Otto, M. E. Holloman, D. Jordan
Department of the Air Force, Washington, DC
Filed 26 Dec 89 9p
PAT-APPL-7-456 899 Available from NTIS: price code N03
A power transmission device for transmitting electric power optically to remote locations is disclosed. The device includes a laser for generating a laser light beam and an optical glass monofilament having a glass core and an outer cladding layer designed to convey the light beams directed into one end of said monofilament to the other end thereof. Means are provided for directing the laser beam into the receiving end for the monofilament at a predetermined angle which causes the light beam to exit from the other end of the monofilament at the same predetermined angle in a conical annulus of light. A conical reflector is disposed within the conical annulus of light exiting from the exit end of the fiber optical monofilament and has surfaces that intercepts the light beams within the conical annulus and reflects them along a different path. Disposed around the conical reflector is a plurality of photovoltaic cells in a position to intercept the reflected light beams and to convert the light beams to electric current. The photovoltaic cells are connected in series to increase the amount of voltage produced by the transmission device. Patent applications.

Printed Circuit Waveguide to Microstrip Transition
See 0232

0369 Process for Fabricating Self-Aligned Field Emitter Arrays
G. J. Campisi, H. F. Gray
Department of the Navy, Washington, DC
Filed 2 Feb 90 10p
PAT-APPL-7-473 752 Available from NTIS: price code N03
This patent application discloses a process for fabricating self-aligned field emitter arrays using a self-leveling planarization technique, e.g. spin-on processes, is disclosed which includes the steps of depositing a dielectric layer on top of an array of field emitters, depositing a thin conducting film over the dielectric layer, and applying a planarization layer on the thin conducting film. Thereafter the structure is selectively etched until the underlying conducting layer is exposed in regions surrounding the field emitters, thereby defining the grid apertures. The conducting layer and dielectric layer are then selectively etched sequentially to a depth sufficient to expose a field emitter cathode tip at each field emitter site. This invention uses the concept of self-leveling, planarizing material to define the grid apertures. After defining the aperture hole size and location, then appropriate etching processes can form the apertures themselves thereby exposing the sharp field emitters which yield an integrally gridded three-dimensional field emitter array structure. Keywords: Patents; Serial number 473,752; N.C. 69,325; Field emission; Electronics.

Programmable Near-Infrared Ranging System
See 0506

0370 Radar Guidance System
R. D. Hilton, G. T. Coate
Department of the Navy, Washington, DC
Filed 2 Mar 86, patented 6 Oct 87 19p
PATENT-4 698 635 Available from Comm. of Patents
An improved radar guidance system is described for the navigation apparatus of an aircraft as it flies over substantially flat terrain with random and different features. The system is generally made up of an airborne radar altimeter, a video signal processor and a master processor. The altimeter transmits a series of pulses at predetermined time intervals for impacting a plurality of spaced points along the aircraft ground track. The echo signal of each pulse impacted point processor divides the amplified signal into corresponding signals. A comparator of the signal processor transforms one of the divided signals into corresponding signals at constant output. A track and hold arrangement of the signal processor correlates the delayed leading edge of the comparator output with the other of the divided signals so as to determine a point of intersection there between. The intersection point is a quantitized value of the delay sample of a given echo signal that is indicative of the average weighted reflectivity value of the preselected annulus of one or more random and different features about a pulse-impacted track point.

Radiosonde
See 0841

Right Angle Microwave Stripline Circuit Connector
See 0246

Semiconductor Heterojunction Device with Graded Bandgap
See 0295

0371 Sensitization Pretreatment of Pb-Salt Epitaxial Films for Schottky Diodes by Sulfur Vapor Exposure
T. K. Chu, F. Santiago
Department of the Navy, Washington, DC
Filed 27 Jul 88, patented 26 Sep 89 7p
PATENT-4 870 027 Available from Comm. of Patents
This patent pertains to a process for preparing an infrared sensitive photodiode comprising the steps of: 1) forming by vacuum deposition an epitaxial layer of a semiconductor alloy material selected from the group consisting of PbSe, PbTe, PbSe(x)Te(1-x), Pb(y)Sn(1-y)Se, Pb(y)Sn(1-y)Te, Pb(y)Sn(1-y)Se(x)Te(1-x), Pb(z)Cd(1-z)Se, Pb(z)Cd(1-z)Te, and Pb(z)Cd(1-z)Se(x)Te(1-x), wherein $0<x<1$, $0<y<1$, and $0<z-1$, to cover at least a portion of the surface of a substrate composed of an infrared transparent single crystal material selected from the group consisting of alkali metal halides and, alkaline earth halides; 2) coating the epitaxial layer of semiconductor alloy material with a thin layer of a lead halide selected from the group consisting of PbCl2, PbBr2, PbF2, and mixtures thereof by exposing the epitaxial layer alloy material to vapor of the lead halide in the presence of a gas selected from the group consisting of air, oxygen, and oxygen/inert gas mixtures; 3) vacuum depositing Pb metal onto a portion of a lead halide coated epitaxial layer of semiconductor alloy material to form a non-Ohmic Pb metal contact; and 4) forming an Ohmic contact on another portion of the epitaxial layer of semiconductor alloy material; The improvement comprises after step (1) but before step (2), vacuum depositing a thin coating of sulfur onto the epitaxial layer of semiconductor alloy material by exposing the epitaxial layer to sulfur vapor.

0372 Sensitized Epitaxial Infrared Detector
A. C. Bouley, H. R. Riedl, J. D. Jensen, S. R. Jost
Department of the Navy, Washington, DC
Filed 17 Mar 82, patented 10 Apr 84 4p
PATENT-4 442 446 Available from Comm. of Patents
An infrared sensitive photodiode is made of an epitaxial layer of a semiconductor alloy which is a lead chalcogenide, a lead-tin chalcogenide, or a lead-cadmium chalcogenide grown on single crystal substrate of an infrared transparent, electrically insulating material, on Ohmic contact deposited on the epitaxial layer, and an non-Ohmic Pb metal contact deposited on the epitaxial layer to form a Schottky barrier, the improvement comprising the inclusion of halide ions in the interface region between the non-Ohmic lead metal contact and the epitaxial layer of semiconductor material. Keywords: Patents, PAT-CL-357-30.

0373 Sequential Rapid Communication Visual Displays
E. Matin, K. R. Boff
Department of the Air Force, Washington, DC
Filed 28 Aug 87, patented 4 Jul 89 12p
PATENT-4 845 645 Available from Comm. of Patents
The rapid communication (RAP-COM) microprocessor controlled memory display system and method operates by presenting real-time data in rapid temporal succession at one spatial location. It can be embodied as a stand-alone instrument or as a small display window within a larger integrated display. It can be incorporated, for example, within larger display configurations in military crew stations, nuclear power plants, air-traffic control centers, space stations, or industrial process control plants. RAP-COM has two advantages over conventional display formats. First, it reduces the amount of required display space by presenting information sequentially in one location rather than simultaneously in several locations. Second it speeds the rate of system-to-operator information transfer by eliminating the time needed for the scanning saccadic eye movements that access information from conventional spatially separated displays. Patents.

0374 Serial Interferometric Fiber-Optic Sensor Array
A. D. Kersey, A. Dandridge
Department of the Navy, Washington, DC
Filed 18 Aug 88, patented 26 Dec 89 7p
PATENT-4 889 986 Available from Comm. of Patents
A new serial interferometric fiber-optic sensor array configuration is disclosed. In a preferred embodiment of the invention pulsed light from a laser source is transmitted into a long input fiber which forms a series of N sensor elements, each of optical path length L. Each sensor element is responsive to any change in an associated predetermined physical parameter for changing its optical path length. A small portion of the optical power in the input fiber is tapped-off to a long output fiber at tap points between adjacent sensor elements and at tap points before the first and after the last sensor elements in order to produce at the output of the last sensor a series of $N + 1$ pulses separated in the time domain. This series of $N + 1$ pulses from the output of the last sensor element is applied to each of two paths in a compensating interferometric of optical path imbalance L. The compensating interferometer coherently mixes pulses obtained from each adjacent pair of tap points to obtain a series of interferometric signals respectively indicative of any change in the physical parameters to which the sensor elements are respectively responsive. Keywords: Patents; PAT-CL-250-227.

0375 Silver Coated Superconducting Ceramic Powder
W. Ferrando
Department of the Navy, Washington, DC
Filed 2 Aug 89 16p
PAT-APPL-7-389 220 Available from NTIS: price code N03
A process for silver coating superconducting ceramic powder by: 1) coating the superconducting ceramic powder particles with silver nitrate; 2) melting the AgNO3 so that it wets and forms a uniform coating over the surfaces of the particles; and 3) decomposing the AgNO3 to form a thin, uniform coating of silver metal on the surfaces of the particles. The product is a loose powder of superconducting ceramic particles which are uniformly coated with silver metal. The powder can be cold worked (e.g., swaged, forged, etc.) to form superconducting structures such as rods or wires. Patent applications.

Solid State Electrical Switch Employing Materials with Reversible Phase Transistors
See 0247

0376 Steroscopic Three Dimensional Large Screen Liquid Crystal Display
T. E. Phillips, J. Marez
Department of the Navy, Washington, DC
Filed 22 Nov 85, patented 3 Mar 87 8p
PATENT-4 647 966 Available from Comm. of Patents
A three dimensional large screen liquid crystal projection display utilizes two liquid crystal light valves in tandem to produce polarization-type stereoscopic images in a large screen display format. Each light valve, driven separately by video input derived either from live scenes or computer generated data, presents one view of a stereoscopic image pair. Using one projection lamp, one projection lens, and a polarizing beamsplitter cube, the two images are optically combined and projected simultaneously onto a non-depo-

larizing screen. The particular optical geometry used results in orthogonal linear polarizations for the two images, so they can be viewed stereoscopically using polaroid glasses with appropriately oriented polarizing axes. Keywords: Patents.

0377 Symmetric Waveguide Junction Combiner
D. R. Bowling, C. F. Smith
Department of the Navy, Washington, DC
Filed 4 Oct 88, patented 1 Aug 89 16p
PATENT-4 853 650 Available from Comm. of Patents
A microwave power combiner has a spherical region from which six rectangular waveguides extend oppositely along mutually orthogonal diameters. The long dimension of each waveguide cross section extends along a diagonal of a cube circumscribing the region and extends orthogonally to this long dimension of the opposite waveguide. One waveguide is an input for an injection locking signal, and four waveguides are an inputs for power to be combined in the region from oscillators controlled by the signal. No circulator is required, and the combined power may be output through the remaining waveguide or through the injection locking input waveguide. A number of the combiners may be connected with the output of one combiner serving as an injection locking input or as one power input to another of the combiners. Patent.

0378 Symmetrical Layered Thin Film Edge Field-Emitter-Array and Method for Its Production
H. F. Gray
Department of the Navy, Washington, DC
Filed 8 Jun 90 17p
PAT-APPL-7-535 612 Available from NTIS: price code N03
A field emitter array device includes a substrate supporting thin film layers of conductive material and intervening thin film layers of insulative material. The lateral edges of the thin film layers form a field emitter array including a field emitter edge electrode interposed between a pair of control electrodes. The control electrode edges produce a symmetric field causing the flow of field emitted electrons to be substantially parallel to the plane of the control and field emitter edge electrodes. The direction of electron flow can be further controlled by additional electrodes in the form of additional thin film conductive layers or external electrodes. A process for making the emitter device includes forming on a support member a plurality of planar first and second thin film layers of insulative material alternately disposed between first, second and third thin film layers of conductive material, forming a channel through the thickness of the layers of oriented perpendicular thereto, exposing the lateral edges of the layers of conductive and insulative materials adjacent to the channel to form a field emitter edge electrode interposed between a pair of control electrodes. Patent applications.

0379 Tailorable Infrared Sensing Device with Strain Layer Superlattice Structure
L. Cheng
National Aeronautics and Space Administration, Pasadena, CA. Pasadena Office
Filed 25 Nov 87, patented 27 Jun 89 10p
PATENT-4 843 439 Available from Comm. of Patents
An infrared photodetector is formed of a heavily doped p-type Ge(x)Si(1-x)/Si superlattice in which x is pre-established during manufacture in the range 0 to 100 percent. A custom tailored photodetector that can differentiate among close wavelengths in the range of 2.7 to 50 microns is fabricated by appropriate selection of the alloy constituency value, x, to establish a specific wavelength at which photodetection cut-off will occur.

0380 Television Monitor Field Shifter and an Opto-Electronic Method for Obtaining a Stereo Image of Optimal Depth Resolution and Reduced Depth Distortion on a Single Screen
D. B. Diner
National Aeronautics and Space Administration, Pasadena, CA. Pasadena Office
Filed 25 Nov 87, patented 4 Apr 89 19p
PATENT-4 819 064 Available from Comm. of Patents
A method and apparatus are developed for obtaining a stereo image with reduced depth distortion and optimum depth resolution. Static and dynamic depth distortion and depth resolution tradeoff is provided. Cameras obtaining the images for a stereo view are converged at a convergence point behind the object to be presented in the image, and the collection-surface-to-object distance, the camera separation distance, and the focal lengths of zoom lenses for the cameras are all increased. Doubling the distances cuts the static depth distortion in half while maintaining image size and depth resolution. Dynamic depth distortion is minimized by panning a stereo view-collecting camera system about a circle which passes through the convergence point and the camera's first nodal points. Horizontal field shifting of the television fields on a television monitor brings both the monitor and the stereo views within the viewer's limit of binocular fusion.

0381 Thermal Image Dynamic Range Expander
T. W. Metcalf
Department of the Navy, Washington, DC
Filed 6 May 85, patented 6 Jan 87 9p
PATENT-4 634 870 Available from Comm. of Patents
A gas cell array absorbs infrared energy radiated by a viewed scene. A laser interferometer has its resultant intensity changed by the cell's changing length. This is monitored by a vidicon tube that feeds the signal to a digitizer and ontc a video display. The incident infrared radiation is chopped into quantized amounts of energy and memory units receive the digitized output of the vidicon tube. Subtractors receive vidicon tube signals simultaneously with quiescent reference levels data. The subtractors form a difference signal by subtracting the quiescent reference level signal from the immediate extended dynamic range of 1,000:1 is accomplished for the preferred embodiment. Keywords: Patents.

0382 Thermal Modulation of Light Beams
L. C. Bobb, J. White, J. P. Davis
Department of the Navy, Washington, DC
Filed 13 Jan 88, patented 22 Aug 89 4p
PATENT-4 859 059 Available from Comm. of Patents
The phase of light passing through an optical waveguide is modulated by applying electric current to heat the waveguide and thereby alter the length and refractive index thereof. An application for the thermal phase modulation concept is provided in a Mach-Zehnder interferometer. Patents.

0383 Ultra-Low-Loss Superconducting Strip-Type Transmission Lines, Circuits, and Resonators
H. Gray, J. M. Pond, I. Kaufman
Department of the Navy, Washington, DC
Filed 1 Dec 89 19p
PAT-APPL-7-444 646 Available from NTIS: price code N03

A method of constructing ultra-low-loss miniaturized microstrip type microwave transmission lines, circuits, and resonators and their resulting structures are disclosed. The method includes etching a groove of the appropriate width and depth into the surface of a first substrate as determined by a preselected characteristic impedance. Appropriate thin film superconductors are then deposited on the surfaces of the first substrate and a second substrate. The thin film superconductors are then patterned after which the two substrates are sealed together by field-assisted thermal bonding such that a novel two-conductor electromagnetic transmission line results. Patent applications.

0384 Universal single point liquid level sensor
J. W. Kronberg
Du Pont de Nemours (E.I.) and Co., Aiken, SC. Savannah River Plant.; Department of Energy, Washington, DC
Filed 2 May 89 14p
PAT-APPL-7-346 490 Available from NTIS: price code A03

A liquid level detector comprises a thermistor and circuitry for determining electrically if the thermistor is wet or dry and additionally, and continuously, if the thermistor is open or shorted. The voltage across the thermistor is filtered to remove low frequency electrical noise, then compared with a reference low voltage to determine if shorted and to a transition voltage chosen to be between the thermistor's nominal wet and dry voltages to determine if the thermistor is wet or dry. The voltage is also compared to the supply voltage using a CMOS gate circuit element to determine if the thermistor is open. The gate passes both faults on to an LED to signal that a fault condition exists or indicates by another LED the wet or dry condition of the thermistor. A pump may be activated through a relay if the thermistor tests wet or dry, as desired. 1 fig.

0385 Wave guide impedance matching method and apparatus
J. W. Kronberg
Du Pont de Nemours (E.I.) and Co., Aiken, SC.; Department of Energy, Washington, DC
Filed 12 May 89 25p
PAT-APPL-7-350 817 Available from NTIS: price code A03

A technique for modifying the end portion of a wave guide, whether hollow and solid, carrying electromagnetic, acoustic or optical energy, to produce a gradual impedance change over the length of the end portion, comprising the cutting of longitudinal, V-shaped grooves that increase in width and depth from beginning of the end portion of the wave guide to the end of the guide so that, at the end of the guide, no guide material remains and no surfaces of the guide as modified are perpendicular to the direction of energy flow. For hollow guides, the grooves are cut beginning on the interior surface; for solid guides, the grooves are cut beginning on the exterior surface. One or more resistive, partially conductive or nonconductive sleeves can be placed over the exterior of the guide and through which the grooves are cut to smooth the transition to free space.

ENERGY: Fuels

0386 Apparatus and method for direct measurement of coal ash sintering and fusion properties at elevated temperatures and pressures
M. R. Khan
Department of Energy, Morgantown, WV. Morgantown Energy Technology Center
Filed 12 May 89 22p
PAT-APPL-7-350 815 Available from NTIS: price code A03

A high-pressure microdilatometer is provided for measuring the sintering and fusion properties of various coal ashes under the influence of elevated pressures and temperatures in various atmospheres. Electrical resistivity measurements across a sample of coal ash provide a measurement of the onset of the sintering and fusion of the ash particulates while the contraction of the sample during sintering is measured with a linear variable displacement transducer for detecting the initiation of sintering. These measurements of sintering in coal ash at different pressures provide a mechanism by which deleterious problems due to the sintering and fusion of ash in various combustion systems can be minimized or obviated. 7 figs.

0387 Combined method for simultaneously dewatering and reconstituting finely divided carbonaceous material
W. W. Wen, A. W. Deurbrouck
Department of Energy, Pittsburgh, PA. Pittsburgh Energy Technology Center
Filed 3 Mar 89 19p
PAT-APPL-7-318 567 Available from NTIS: price code A03

This report describes a process whereby a finely-divided carbonaceous material is dewatered and reconstituted in a combined process by adding a binding agent directly into slurry of finely divided material and dewatering the material to form a cake or consolidated piece. This can be hardened by drying at ambient or elevated temperatures. Alternatively, the binder often in the form of a crusting agent is sprayed onto the surface of a moist cake prior to curing. 8 figs.

0388 Diazido Alkanes and Diazido Alkanols as Combustion Modifiers for Liquid Hydrocarbon Ramjet Fuels
R. S. Miller, R. M. Moriarty, C. K. Law
Department of the Navy, Washington, DC
Filed 3 Jul 86, patented 3 May 88 6p
PATENT-4 741 742 Available from Comm. of Patents

This invention relates to liquid hydrocarbon ramjet fuel containing a additive which is a diazido alkane of the formula N3CH2(CH2)nCH2N3 wherein n is an integer of from 1 to 20 or a diazido alkanol of the formula N3CH2(CHOH(CH2)yCH2N3 wherein x is an integer of from 0 to 9, y is an integer of from 0 to 19, x + y in an integer of from 0 to 19, and x < or = y. Keywords: Patents.

Genetically engineered acidophilic heterotrophic bacteria by bacteriophage transduction
See 0728

Hydrocarbon Group-Type Analyzer System
See 0042

0389 Method and Apparatus for Assessing Distillate Fuel Stability by Oxygen Overpressure
D. R. Hardy, E. J. Beal, J. C. Burnett
Department of the Navy, Washington, DC
Filed 27 Jun 89 22p
PAT-APPL-7-371 782 Available from NTIS: price code N03
Reactions leading to insoluble sediments formation in distillate fuel are accelerated by forcing oxygen into solution in the fuel at pressures of between about 90 and 110 psig and then stressing the fuel under conditions of accelerated storage at temperatures of between about 40 C to 100 C. The method then makes use of gravimetric determination of the total insoubles formed. The stability of the fuel over a period of time as well as its comparitive stability to other fuels can then be predicted from the amount of insolubles formed. The method can be carried out by using a specialized pressure vessel. Keywords: Military publications, Reports, Periodicals, Scientific literature.

0390 Method and Apparatus for In situ Biological Conversion of Coal to Methane
J. Volkwein
Bureau of Mines, Washington, DC
Filed 20 Jun 90 18p
PAT-APPL-7-540 598 Available from NTIS: price code N03
The invention relates in general to a method for biologically converting coal to methane, and in particular to a method and apparatus for culturing in situ on a coal-containing substrate a consortium of microorganisms capable of degrading coal into methane under suitable anaerobic conditions.

0391 Method of Extracting Coal from a Coal Refuse Pile
P. M. Yavorsky
Department of the Interior, Washington, DC
Filed 18 Sep 89 12p
PAT-APPL-7-408 586 Available from NTIS: price code A03
A method of extracting coal from a coal refuse pile comprises soaking the coal refuse pile with an aqueous alkali solution and distributing an oxygen-containing gas throughout the coal refuse pile for a time period sufficient to effect oxidation of coal contained in the coal refuse pile. The method further comprises leaching the coal refuse pile with an aqueous alkali solution to solubilize and extract the oxidized coal as alkali salts of humic acids and collecting the resulting solution containing the alkali salts of humic acids. Calcium hydroxide may be added to the solution of alkali salts of humic acid to form precipitated humates useable as a low-ash, low-sulfur solid fuel.

Sampling apparatus for real-time alkali monitor
See 0133

ENERGY: Heating & Cooling

0392 Advanced Heat Pump
J. L. Ashley, J. D. Matthews
Department of the Navy, Washington, DC
Filed 11 Sep 89 12p
PAT-APPL-7-405 828 Available from NTIS: price code N03
This patent application discloses a heat pump which includes a first packed bed of liquid desiccant for removing moisture from outside air in the heating mode of operation, and a pump for transferring the moisture laden desiccant to a second packed bed which humidifies condenser heated inside air by adding water vapor to the air. The first packed bed, by removing moisture from the outside air before it passes through the heat pump's evaporator coils, prevents frost from forming on the coils. In the cooling mode of operation the second packed bed of liquid desiccant removes water vapor from the air inside of the building. The moisture laden desiccant is then transferred to the first packed bed by a second pump where condenser heat transfers the moisture from the desiccant to outside air.

0393 Apparatus for Cooling Electronic Components in Aircraft
F. E. Altoz
Department of the Navy, Washington, DC
Filed 25 Jan 89 27p
PAT-APPL-7-304 048 Available from NTIS: price code N03
A ram air cooling system for cooling electronic components in an aircraft provides automatic switching from a high ram air speed cooling mode (ACM) to a low ram air speed cooling mode (RAM). The cooling system receives variable speed ram air during the flight of the aircraft and includes an automatically controlled valve for either directing high speed ram air to a precooling means prior to cooling the electronic components or directing low speed ram air directly to the electronic components without precooling. The automatically controlled valve is controlled by programmable logic module means for comparing the cooling efficiency of the electronic components by precooled ram air with the cooling efficiency of the electronic components by the non-precooled ram air. The cooling efficiencies are calculated from temperature measurements of the ram air at several locations in the system of the invention. Preferably, the ram air cooling means is an air turbine which extracts energy from the ram air to drive a compressor that compresses and discharges heated air that exists from the housing for the electronic components after the ram air has performed its cooling function. Patent applications.

Apparatus for Cooling Electronic Components in Aircraft
See 0308

Ceramic Heat Pipe Wick
See 0593

0394 Perforated Flame Deflector
E. Swiatosz
Department of the Navy, Washington, DC
Filed 22 Jun 89, patented 19 Jun 90 1p
PATENT-4 934 927 Available from Comm. of Patents
A series of perforated plates are placed in alignment with a horizontally disposed burner tube and canted to spread the flame from the burner axially and transverse the axis of the tube. Each perforation is accompanied by an upper scoop that extends downward and toward the tube to direct some of the upward flowing flame through the perforation. Thereby, the flame is spread in both length and width to cover a larger grating surface above the tube. Patents.

0395 Self-powered automatic secondary air controllers for woodstoves and small furnaces
D. D. Siemer
Westinghouse Idaho Nuclear Co., Inc., Idaho Falls.;
Department of Energy, Washington, DC
Filed 15 Mar 89 56p
PAT-APPL-7-323 924 Available from NTIS: price code A03

This invention relates to the regulation of combustion in woodstoves, small furnaces and the like, so as to produce efficient combustion, while maximizing the possible heat output and minimizing air pollution. More specifically, the invention relates to controllers for automatically regulating and the supply of secondary combustion air to woodstoves, small furnaces or the like. 9 figs.

0396 Variable Air Flow Eddy Control
K. Crouch
National Institutes of Health, Bethesda, MD
Filed 23 Aug 89 20p
PAT-APPL-7-397 226 Available from NTIS: price code N03
The invention relates to apparatus and methods for controlling the flow of fluid around an object. In particular, the present invention relates to apparatus and methods for controlling the formation of eddies and the flow of fluid borne particles around an object located in a fluid flow path.

ENERGY: Solar

0397 Heat Engine Based on Shape Memory Alloys
D. Goldstein
Department of the Navy, Washington, DC
Filed 1 Dec 89 12p
PAT-APPL-7-444 350 Available from NTIS: price code N03
This patent application discloses a tubular gear made of shape memory alloy in sheet form, having longitudinal corrugations and being floating supported for rotation about an axis fixedly spaced from the rotational axis of a roller gear in meshing engagement with the corrugations. The tubular gear is sequentially deformed by exposure to radiated heat causing the shape memory alloy to expand circumferentially and by said meshing engagement with roller gear. Such deformation of the tubular gear within differential temperature regions established by restricted exposure to the radiated heat, induces and sustains rotation of the tubular gear to convert the heat energy into mechanical energy. Keywords: Outer space; Solar energy conversion; Crystal structure transition temperature; Nickel titanium nitinol alloy.

ENERGY: Other

Annealing Group III-V Compound Doped Silicon-Germanium Alloy for Improved Thermo-Electric Conversion Efficiency
See 0591

0398 Cable Suspended Windmill
M. G. Farmer
National Aeronautics and Space Administration, Hampton, VA. Langley Research Center
Filed 15 Sep 88, patented 16 Jan 90 8p
PATENT-4 894 554 Available from Comm. of Patents
A windmill is disclosed which includes an airframe having an upwind end and a downwind end. The first rotor is rotatably connected to the airframe, and a generator is supported by the airframe and driven by the rotor. The airframe is supported vertically in an elevated disposition by poles which extend vertically upwardly from the ground and support cables which extend between the vertical poles. Suspension cables suspend the airframe from the support cable.

Combined coal gasifier and fuel cell system and method
See 0057

Conductive ceramic composition and method of preparation
See 0594

0399 Copper Chloride Cathode for a Secondary Battery
R. V. Bugga, S. Distefano, G. Nagasubramanian, C. P. Bankston
National Aeronautics and Space Administration, Pasadena, CA. Pasadena Office
Filed 11 Sep 89 13p
PAT-APPL-7-405 169 Available from NTIS: price code N03
Higher energy and power densities are achieved in a secondary battery based on molten sodium and a solid, ceramic separator such as a beta alumina and a molten catholyte such as sodium tetrachloroaluminate and a copper chloride cathode. The higher cell voltage of copper chloride provides higher energy densities and the higher power density results from increased conductivity resulting from formation of copper as discharge proceeds.

0400 Elastomeric Impulse Energy Storage and Transfer System
L. C. Bissonnette
Department of the Navy, Washington, DC
Filed 1 Jul 87, patented 18 Jul 89 4p
PATENT-4 848 210 Available from Comm. of Patents
The present invention relates to projectile launching devices and more particularly to an energy storage and low-noise launch system using an elastomeric bladder as the energy storage medium. It is a general purpose and object of the present invention to provide an improved, impulse energy storage and transfer system. Further objects are that this system exhibit a relatively high mechanical efficiency, be simple, reliable and low in cost. These objects are accomplished with the present invention by providing, in combination, a device for storing potential energy in the form of a distended, fluid medium filled, elastomeric bladder and rapidly converting that stored energy into kinetic energy of the working fluid for quietly ejecting a projectile along with the stored fluid from the device and into the surrounding fluid medium. The stored working fluid flows through a tubular launch tube enclosing a projectile. The moving fluid acts to expel the projectile entrained therein. Such an energy storage and transfer system is particularly well suited for, but not limited to, submarine launcher system applications. The present invention can provide the energy required to quietly launch a projectile, such as a torpedo from a submarine. Keywords: Patents.

0401 Electrochemical Preparation of Silver Oxide Electrodes Having High Thermal Stability
D. R. Glen, A. N. Mansour, K. M. O'Neill, S. Dallek, B. F. Larrick
Department of the Navy, Washington, DC
Filed 2 Aug 89 15p
PAT-APPL-7-674 254 Available from NTIS: price code N03
This invention relates to electrochemical cells and more particularly to silver oxide electrodes. Accordingly an object of this invention is to provide a new method of electrochemically preparing AgO electrodes. Another object of this invention is to provide a method of increasing the shelf life of electrochemically prepared Silver oxide electrodes. A fur-

ther object of this invention is to increase the energy capacity of electrochemically prepared AgO electrodes. These and other objects of this invention are achieved by proving in the process for preparing AgO cathodes by anodizing silver plaques in basic electrolytes, the improvement of performing the anodizing process at a temperature in the range of from about 70 C to just under the reflux temperature of the electrolyte.

Heat Engine Based on Shape Memory Alloys
See 0397

0402 High Temperature Molten Salt Thermal Electrochemical Cell
E. J. Plichta, W. K. Behl
Department of the Army, Washington, DC
Filed 12 Feb 90 10p
PAT-APPL-7-478 796 Available from NTIS: price code N03
This invention relates in general to a high temperature molten salt thermal electrochemical cell and in particular to such a cell including cobalt oxide (Co3O4) as the cathode material. High temperature molten salt thermal electrochemical cells are widely used as power sources for projectiles, rockets, bombs, mines, missiles, decoys, jammers and torpedoes. These are also used as fuses. Thermal electrochemical cells are reserve-type cells that can be activated by heating with a pyrotechnic heat source such as zirconium and barium chromate powders or mixtures of iron powder and potassium perchlorate. Keywords: Patent applications.

Method and apparatus for making multistrand superconducting cable
See 0341

0403 Organic Cathode for a Secondary Battery
R. V. Bugga, S. Distefano, R. M. Williams, C. P. Bankston
National Aeronautics and Space Administration, Pasadena, CA. Pasadena Office
Filed 7 Sep 89 20p
PAT-APPL-7-404 288 Available from NTIS: price code N03
A liquid catholyte for a battery based on liquid metal such as sodium anode and a solid, ceramic separator such as beta alumina (BASE) comprises a mixture of a Group I-III metal salt such as sodium tetrachloroaluminate and a minor amount of an organic carbonitrile depolarizer having at least one adjacent ethylenic band such as 1 to 40 percent by weight of tetracyanoethylene. The tetracyanoethylene forms an adduct with the molten metal salt.

0404 Phase Control Mechanism for Wave Energy Conversion
P. N. Jaenichen Sr
Department of the Navy, Washington, DC
Filed 7 Dec 88, patented 10 Oct 89 7p
PATENT-4 872 309 Available from Comm. of Patents
A phase control mechanism for a wave energy conversion apparatus is provided by means of a cam brake locking mechanism. Frictionally contacting locking cams retain a reciprocable drive shaft alternately in upper lower positions with minimal expenditure of electrical power. When the wave crests and troughs have reached predetermined levels, the cams are released allowing the drive shaft of the mechanism to translate to the opposite position. Water; Waves; Buoyant bodies; Patents.

0405 Silver Composite Cathodes for Alkaline Secondary Batteries
W. Ferrando
Department of the Navy, Washington, DC
Filed 2 Aug 89 13p
PAT-APPL-7-389 218 Available from NTIS: price code N03
This invention relates to electrochemical cells and more particularly to silver electrodes for electrochemical cells. Accordingly, an object of this invention is to provide a new, lighter weight silver electrode for secondary cells. Another object of this invention is to provide an electrode which requires less silver to operate. A further object of this invention is to provide a silver electrode which uses the silver more efficiently. Yet another object of the invention is to provide an easier, less expensive method of manufacturing silver electrodes for secondary cells. Patent applications.

0406 Silver-Nickel Composite Cathodes for Alkaline Secondary Batteries
W. Ferrando
Department of the Navy, Washington, DC
Filed 16 Aug 89 13p
PAT-APPL-7-395 547 Available from NTIS: price code N03
A method for producing lightweight silver-nickel composite electrodes by infiltrating a graphite fiber plaque with a suspension of finely divided nickel powder in an aqueous solution of AgNO3; drying the graphite fiber plaque to produce a coating of AgNO3 crystals and nickel particles on the surfaces of the graphite fibers; heating the coated graphite fiber plaque at a temperature about the melting point of AgNO3 until the AgNO3 melts and wets the nickel particles and the surfaces of the graphite fibers; and heating the molten AgNO3 coated graphite fiber plaque at a temperature from the decomposition temperature of AgNO3 to about 600 C until the AgNO3 decomposed to form a thin uniform silver metal coating over the nickel particles and the surfaces of the graphite fibers. The silver-nickel particle coated graphite plaques is electrochemically treated to convert the silver to silver active material (Ag2O2) and the nickel to nickel active material Ni(OH)2). Keywords: Silver peroxide; Silver nitrate; Nickel hydrocide; Patent applications.

Temperature Adaptable Textile Fibers and Method of Preparing Same
See 0571

0407 Thermal Switch Disc for Short Circuit Protection of Batteries
E. C. Darcy, B. J. Bragg
National Aeronautics and Space Administration, Houston, TX. Lyndon B. Johnson Space Center
Filed 27 Apr 89 13p
PAT-APPL-7-343 652 Available from NTIS: price code N03
A protective device for one battery or serially arranged battery cells is disclosed and is adapted to fit between one battery and its terminal connector or between adjacent battery cells. The device incorporates a disk of positive temperature coefficient material having a pair of circular end faces for contact. The disk is supported by a ring adhesively joined thereto, the ring having a central axial opening to enable the button terminal of a battery cell to contact against the disk as the disk and battery cell are arranged in a single battery application or in serial contact with similar battery cells.

HYDRAULIC & PNEUMATIC EQUIPMENT

Electrostatically Suspended Rotor for Angular Encoder
See 0452

Extreme pressure fluid sample transfer pump
See 0453

0408 **Fluid Lock**
W. E. Haynes
Department of the Air Force, Washington, DC
Filed 18 Jun 87, patented 9 May 89 12p
PATENT-4 828 207 Available from Comm. of Patents
This fluid lock permits transiting an object between different fluid pressure through a transiting hole in a wall separating a higher fluid pressure side from a lower fluid pressure side on opposite sides of the wall; has higher and lower fluid pressure doors, each hinged for pivotal movement between an open position for permitting transiting through the hole from one to the other pressure side and a closed position for sealing the opening; and has a transiting container formed between the doors in closed position, and closely form fitting the transiting object, for minimizing the loss of fluid between the sides during transiting the object through the hole. Patents.

Fluidic Gain Changer
See 0455

Hybrid Butterfly Valve
See 0460

Jam Resistant Fluid Power Actuator for Ballistic-Damage Tolerant Redundant Cylinder Assemblies
See 0461

Speed control with end cushion for high speed air cylinder
See 0477

Turbomachinery Rotor Support with Damping
See 0136

Turbomachinery Shaft Insert
See 0137

Vibration Analyzer
See 0138

INSTRUMENTATION & TEST EQUIPMENT

0409 **Acoustic Controlled Rotation and Orientation**
M. B. Barmatz, J. L. Allen
National Aeronautics and Space Administration, Pasadena, CA. Pasadena Office
Filed 29 Oct 86, patented 31 Jan 89 10p
PATENT-4 800 756 Available from Comm. of Patents
Acoustic energy is applied to a pair of locations spaced about a chamber, to control rotation of an object levitated in the chamber. Two acoustic transducers applying energy of a single acoustic mode, one at each location, can (one or both) serve to levitate the object in three dimensions as well as control its rotation. Slow rotation is achieved by initially establishing a large phase difference and/or pressure ratio of the acoustic waves, which is sufficient to turn the object by more than 45 deg, which is immediately followed by reducing the phase difference and/or pressure ratio to maintain slow rotation. A small phase difference and/or pressure ratio enables control of the angular orientation of the object without rotating it. The sphericity of an object can be measured by its response to the acoustic energy.

Acoustic Intensity Probe
See 0180

Actuator Rate Saturation Compensator
See 0301

0410 **Adjustable Depth Gage**
R. C. Forsgren
National Aeronautics and Space Administration, Cleveland, OH. Lewis Research Center
Filed 7 Jul 89 10p
PAT-APPL-7-376 738 Available from NTIS: price code A02
A quick adjust depth gage includes a handle-clamp assembly wherein the clamp includes an opening in which a cylindrical shaft with suitable depth measurement markings thereon is reviewed. Turning the handle on the clamp enables the gage to be set to the desired depth.

Airplane Takeoff and Landing Performance Monitoring System
See 0937

Almond Test Body
See 0303

Apparatus and Method for Characterizing the Transmission Efficiency of a Mass Spectrometer
See 0894

Apparatus and method for direct measurement of coal ash sintering and fusion properties at elevated temperatures and pressures
See 0386

Apparatus and Method for Locating the Axis of Symmetry (Center of Circular Cross Section) of Three Dimensional Objects
See 0205

Apparatus and Method for Minimizing Polarization-Induced Signal Fading in an Interferometric Fiber-Optic Sensor Using Input-Polarization Modulation
See 0307

0411 **Apparatus and Method for Monitoring Pressure Leaks from a Sealed System**
J. A. Welch
Department of the Navy, Washington, DC.; National Aeronautics and Space Administration, Washington, DC
Filed 5 Jun 89 14p
PAT-APPL-7-361 074 Available from NTIS: price code A03
The present invention described herein relates to the field of measuring pressure changes in sealed systems. More specifically, the invention relates to measuring pressure changes in sealed lamps. The invention especially relates to measuring pressure changes due to leaks in sealed lamps used in an infrared jammer. Lamps used in infrared jamming and other applications contain evacuated or pressurized gases in a sealed chamber. Such lamps are surrounded by sealed envelopes. When leaks occur into the evacuated chamber, catastrophic lamp failure or implosion may occur resulting in injury to personnel and extensive property damage.

0412 Ballast System for Maintaining Constant Pressure in a Glove Box
P. J. Shlichta
National Aeronautics and Space Administration, Pasadena, CA. Pasadena Office
Filed 29 Sep 89 13p
PAT-APPL-7-414 812 Available from NTIS: price code N03
A ballast system is disclosed for a glove box including a fixed platform on which is mounted an inflatable bag on top of which resides a cover and a weight. The variable gas volume of the inflatable bag communicates with that of the glove box via a valved tube. The weight and the gas volume are selected to maintain a relatively constant pressure in the glove box despite variations in the glove box volume while avoiding the use of complicated valving apparatus.

Bidirectional Draining Pore-Fluid Vessel
See 0038

Block Patterning of the Metallization of Polyvinylidene Fluoride Transducers
See 0250

0413 Bucket Wheel Assembly for a Flow Measuring Device
J. C. Futrell
Department of the Interior, Washington, DC
Filed 10 Sep 87, patented 19 Sep 89 4p
PATENT-4 866 985 Available from Comm. of Patents
A bucket wheel assembly for use in a flow measuring device is disclosed which comprises a one-piece, lightweight molded plastic disk having a plurality of roughly conical cups connected to a central ring. The central ring is mounted on a shaft and the disk rotates in response to fluid pressure in order to generate a signal proportional to flow velocity. The bucket wheel is advantageous over prior art versions in that it is responsive only to the horizontal component of flow velocity, when rigidly held, and thus gives truer and more accurate information with regard to current flow, particularly when used in current meters measuring flowing streams and rivers.

Cable Tester
See 0311

Coaxial Probe for Measuring the Current Density Profile of Intense Electron Beams
See 0314

Colinear Fluctuating Wall Shear Stress and Fluctuating Pressure Transducer
See 0896

Continuum Source Atomic Absorption Spectrometry
See 0039

Delamination Test Apparatus and Method
See 0548

Detection of Oxygen in Thin Films
See 0040

Device and Method for Detecting and Displaying Crossover Pattern in Precision Winding
See 0484

0414 Device for Inspection of Materials by Eddy Current Methods
S. N. Vernon, S. S. Lane
Department of the Navy, Washington, DC
Filed 30 Jun 89 17p
PAT-APPL-7-374 212 Available from NTIS: price code N03
With the growing application of filament-wound conductive fiber reinforced composites, particularly in aerospace, there is an increasing demand for nondestructive methods to detect and measure fiber anomalies such as service-incurred broken fibers and fabrication-related variations in fiber volume fraction or fiber density. Eddy current technology is ideally suited to these tasks since it is the conductive fibers which carry most of the current (carbon-carbons) or all of the current (graphite epoxies). Eddy current transducers may be used alone or in various combinations. A particular transducer may be both the transmitter and the receiver if the transducer is operating in the reflection mode. Patent applications.

0415 Device for Quickly Sensing the Amount of O2 in a Combustion Product Gas
J. J. Singh, W. T. Davis, R. L. Puster
National Aeronautics and Space Administration, Hampton, VA. Langley Research Center
Filed 9 Mar 88, patented 27 Mar 90 7p
PATENT-4 911 890 Available from Comm. of Patents
A sensing device comprising an O2 sensor, a pump, a compressor, and a heater is provided to quickly sense the amount of O2 in a combustion product gas. A sample of the combustion product gas is compressed to a pressure slightly above one atmosphere by the compressor. Next, the heater heats the sample between 800 C and 900 C. Next, the pump causes the sample to be flushed against the electrode located in O2 sensor 6000 to 10,000 times per second. Reference air at approximately one atmosphere is provided to the electrode of O2 sensor. Accordingly, the C2 sensor produces a voltage which is proportional to the amount of oxygen in the combustion product gas. This voltage may be used to control the amount of O2 entering into the combustion chamber which produces the combustion product gas.

Differential Polarimetric Fiber Optic Sensor
See 0853

Dual Cathode System for Electron Beam Instruments
See 0320

0416 Eddy Current Method for Measuring Electrical Resistivity and Device for Providing Accurate Phase Detection
S. N. Vernon, P. M. Gammell
Department of the Navy, Washington, DC
Filed 9 Jan 89, patented 1 May 90 13p
PATENT-4 922 201 Available from Comm. of Patents
This invention relates to a method and devices for measuring the resistivity of materials. In particular, the methods measure resistivity in carbon fiber reinforced composites as well as any materials with a relative magnetic permeability of 1. The measurement may be made with access restricted to a single side of the material under test. The present invention relates to the field of nondestructive inspection of materials. In particular, this invention involves methods and a device of eddy current inspection for estimating the electrical resistivity of materials. While the method applies to all materials with a relative magnetic permeability of 1, it is

particularly useful when the test material falls in one or more of three categories: (1) the resistivity falls within a range for which there are no calibration standards; (2) only one surface of the test material is accessible; and (3) the resistivity is frequency dependent and must be determined over a particular range of frequencies. Keywords: Patents, PAT-CL-320-236.

Electron Paramagnetic Resonance Instrument with Superconductive Cavity
See 0898

0417 Expert overseer for mass spectrometer system
E. E. Filby, R. A. Rankin
Westinghouse Idaho Nuclear Co., Inc., Idaho Falls.; Department of Energy, Washington, DC
Filed 4 Apr 89 40p
PAT-APPL-7-333 075 Available from NTIS: price code A03
An expert overseer for the operation and real-time management of a mass spectrometer and associated laboratory equipment. The overseer is a computer-based expert diagnostic system implemented on a computer separate from the dedicated computer used to control the mass spectrometer and produce the analysis results. An interface links the overseer to components of the mass spectrometer, components of the laboratory support system, and the dedicated control computer. Periodically, the overseer polls these devices and as well as itself. These data are fed into an expert portion of the system for real-time evaluation. A knowledge base used for the evaluation includes both heuristic rules and precise operation parameters. The overseer also compares current readings to a long-term database to detect any developing trends using a combination of statistical and heuristic rules to evaluate the results. The overseer has the capability to alert lab personnel whenever questionable readings or trends are observed and provide a background review of the problem and suggest root causes and potential solutions, or appropriate additional tests that could be performed. The overseer can change the sequence or frequency of the polling to respond to an observation in the current data.

Fatigue Testing Apparatus
See 0598

0418 Fatigue Testing Apparatus
J. H. Carder
Department of the Navy, Washington, DC
Filed 23 Feb 90 12p
PAT-APPL-7-483 687 Available from NTIS: price code N03
This invention relates generally to the fatigue testing of wire by cyclic displacement under tension while immersed in a test medium. A pair of wire specimens supported within a transparent frame along direction changing paths established by two sets of pulleys are interconnected between a common powered rotor and a pair of wire tensioning weights protectively enclosed by plastic sheathings. The wire specimens are simultaneously and cyclically displaced along said paths through test medium during a testing operation terminated in response to rupture detected by sensing switches engaged by the weights. Patent applications.

Fatigue Testing Apparatus
See 0902

0419 Fiber-optic pressure sensor
R. S. Dingus
Los Alamos National Lab., NM.; Department of Energy, Washington, DC
Filed 10 Mar 89 12p
PAT-APPL-7-322 320 Available from NTIS: price code A03
A pressure wave sensor utilizing fiber optic interferometry techniques to determine pressure in a bar. Light from a fiber optic coil around the bar is mixed with light from a reference optical fiber to produce interference fringes as a function of time. These fringes over time are related to the pressure versus time existing in the bar. 2 figs.

Fiber Optic Sensing System
See 0859

0420 Flowmeter for gas-entrained solids flow
K. G. Porges
Argonne National Lab., IL.; Department of Energy, Washington, DC
Filed 20 Apr 89 20p
PAT-APPL-7-341 004 Available from NTIS: price code A03
An apparatus and method for the measurement of solids feedrate in a gas-entrained solids flow conveyance system. The apparatus and method of the present invention include a vertical duct connecting a source of solids to the gas-entrained flow conveyance system, a control valve positioned in the vertical duct, and a capacitive densitometer positioned along the duct at a location a known distance below the control valve so that the solid feedrate, Q, of the gas entrained flow can be determined by Q = S(rho)(phi) v(sub S) where S is the cross sectional area of the duct, (rho) is the density of the solid, (phi) is the solid volume fraction determined by the capacitive densitometer, and v(sub S) is the local solid velocity which can be inferred from the known distance of the capacitive densitometer below the control valve.

Fully Articulated Four-Point-Bend Loading Fixture
See 0456

0421 Furnace for Tensile/Fatigue Testing
P. K. Brindley
National Aeronautics and Space Administration, Cleveland, OH. Lewis Research Center
Filed 21 Jul 89 11p
PAT-APPL-7-382 885 Available from NTIS: price code A03
Mechanical properties of short test specimens are tested in tension and fatigue using an improved electrical resistance heating furnace having a short length that mounts between the grips of a typical testing machine. The furnace includes a ceramic inner liner having an oval cross-section to reduce heat loss at the ends. The furnace is divided into a plurality of individually controlled heating zones. Provision is made to supply an inert gas to the volume around the specimen in the center of the furnace.

Gyro Sensor Block Suspension
See 0840

High Optical Density Measuring Spectrometer
See 0860

High Power, High Sensitivity Microwave Calorimeter
See 0328

High-Pressure Promoted Combustion Chamber
See 0129

High Resolution Cinephotographics System Pressure Vessel
See 0862

High Resolution Technique and Instrument for Measuring Lattice Parameters in Single Crystals
See 0905

High Temperature Ultrasonic Testing of Materials for Internal Flaws
See 0602

Hydrocarbon Group-Type Analyzer System
See 0042

Hydrostatic self-aligning axial/torsional mechanism
See 0603

Ignitability Test Method and Apparatus
See 0130

In-line rotating torque sensor with on-board amplifier background of the invention
See 0330

Induction-Type Metal Detector with Increased Scanning Area Capability
See 0331

Infrared Fiber-Optical Temperature Sensor
See 0332

Insect Detection Using a Pitfall Probe Trap Having Vibration Detection
See 0016

0422 Interferometric Surface Distortion Detector
A. E. Scotese, S. L. Huang, A. J. Gaetano
Department of the Navy, Washington, DC
Filed 20 Apr 89 14p
PAT-APPL-7-342 919 Available from NTIS: price code A03
Portable shadow moire apparatus is disclosed for indiscriminately manipulating the grid and light source thereof over a specimen surface, with the grid oriented substantially in parallel therewith and in close proximity thereto. Self aligning support is provided on such apparatus, along with height adjustability for that support. Utilization of very high density grids is made possible by such apparatus to enhance the detection sensitivity thereof. Light source direction variability is also provided to control the magnitude of detectable distortion. Patent applications.

0423 Ionizing radiation detector
L. H. Thacker
Oak Ridge National Lab., TN.; Department of Energy, Washington, DC
Filed 8 Jun 89 10p
PAT-APPL-7-363 032 Available from NTIS: price code A03
An ionizing radiation detector is provided which is based on the principal of analog electronic integration of radiation sensor currents in the sub-pico to nano ampere range between fixed voltage switching thresholds with automatic voltage reversal each time the appropriate threshold is reached. The thresholds are provided by a first NAND gate Schmitt trigger which is coupled with a second NAND gate Schmitt trigger operating in an alternate switching state from the first gate to turn either a visible or audible indicating device on and off in response to the gate switching rate which is indicative of the level of radiation being sensed. The detector can be configured as a small, personal radiation dosimeter which is simple to operate and responsive over a dynamic range of at least 0.01 to 1000 R/hr.

0424 Leak detection aid
T. J. Steeper
Du Pont de Nemours (E.I.) and Co., Aiken, SC.; Department of Energy, Washington, DC
Filed 15 Feb 89 9p
PAT-APPL-7-310 556 Available from NTIS: price code A02
A leak detection apparatus and method for detecting leaks across an O-ring sealing a flanged surface to a mating surface is an improvement in a flanged surface comprising a shallow groove following O-ring in communication with an entrance and exit port intersecting the shallow groove for injecting and withdrawing, respectively, a leak detection fluid, such as helium. A small quantity of helium injected into the entrance port will flow to the shallow groove, past the O-ring and to the exit port.

0425 Liquid Level Measurement System for Analog and Digital Readout
E. A. Dahl
Department of the Navy, Washington, DC
Filed 27 Jun 88, patented 15 Aug 89 6p
PATENT-4 857 894 Available from Comm. of Patents
An elongated level sensor system has an optical prism formation molded or cut in a side, and includes a plurality of LED light sources and corresponding photo cells positioned along its length. Light from the LED sources are reflected off the prism surfaces to respective photocells when there is no liquid present in the area, thereby indicating 'no liquid media present'. When liquid surrounds a particular section, light from the LED is not reflected from the prism surfaces, but is refracted out; the change in photocell voltage then indicates the presence of liquid storage areas, and reads out simultaneously at a remote sensor/alarm panel. Patents.

0426 Long Range Light Pen
A. H. Marshall, R. S. Wolff, R. T. McCormack, E. J. Purvis
Department of the Navy, Washington, DC
Filed 25 Nov 88, patented 8 May 90 10p
PATENT-4 923 401 Available from Comm. of Patents
Disclosed is a marksmanship trainer that can accommodate a plurality of trainees. The trainer includes the long range light pen that is the present invention to measure sighting accuracy and tracking steadiness. In the disclosure it is set with the sight of a simulated or operational weapon, and achieves resolution to the pixel level by using telescope optics and special purpose circuitry. Each trainee is provided with a raster scan display and a computer that provide a targe image and corrective feedback to the trainee. Bridge configured dual strain gauges are used to sense breathing, and a force sensing resistor is used to monitor trigger squeeze. Recoil is simulated mechanically, and a simulated report of the weapon is provided through a headset. The feedback of corrective action is provided aurally/graphically from a stored expert library. Keywords: Optical devices; Patents; PAT-CL-434-22.

Magneto Acoustic Emission Apparatus for Testing Materials for Embrittlement
See 0578

Magnetostrictive Torque Sensor
See 0908

0427 Marksmanship Expert Trainer
A. H. Marshall, R. T. McCormack, E. J. Purvis, R. S. Wolff, H. C. Towle
Department of the Navy, Washington, DC
Filed 25 Nov 88, patented 8 May 90 10p
PATENT-4 923 402 Available from Comm. of Patents
The invention is a marksmanship trainer that can accommodate a plurality of trainees. The trainer includes a long range light pen to measure sighting accuracy and tracking steadiness. It is set with the sight of a simulated or operational weapon, and achieves resolution to the pixel level by using telescope optics and special purpose circuitry in addition to its computer board. Each trainee is provided with a raster scan display and a computer that provide a target image and corrective feedback to the trainee. Bridge configured dual strain gauges are used to sense breathing, and a force sensor resistor is used to monitor trigger squeeze. Recoil is simulated mechanically, and a simulated report of the weapon is provided through a headset. The feedback of corrective action is provided aurally/graphically from a stored expert library. Keywords: Patents; PAT-CL-434-22.

Method and Apparatus for Assessing Distillate Fuel Stability by Oxygen Overpressure
See 0389

Method and Apparatus for Detecting Laminar Flow Separation and Reattachment
See 0909

0428 Method and Apparatus for Determining Time, Direction and Composition of Impacting Space Particles
W. H. Kinard, J. J. Wortman, P. C. Kassel, F. S. Singer, D. H. Humes
National Aeronautics and Space Administration, Hampton, VA. Langley Research Center
Filed 21 Jun 89 19p
PAT-APPL-7-369 490 Available from NTIS: price code A03
A space particle collector for recording the time specific particles are captured, and its direction at the time of capture, utilizes an array of targets, each comprised of an MOS capacitor on a chip charges from an external source and discharged upon impact by a particle through a tab on the chip that serves as a fuse. Any impacting particle creates a crater, but only the first will cause a discharge of the capacitor. A substantial part of the metal film around the first crater is burned off by the discharge current. The time of the impulse which burns the tab, and the identification of the target, is recorded together with data from flight instruments. The metal film is partitioned into pie sections to provide a plurality of targets on each of an array of silicon wafers, thus increasing the total number of identified particles that can be collected. It is thus certain which particles were captured at what specific times.

0429 Method and Apparatus for Maintaining Thermal Control in Plasma Conditions
A. F. Whitaker
National Aeronautics and Space Administration, Huntsville, AL. George C. Marshall Space Flight Center
Filed 28 Jul 89 10p
PAT-APPL-7-386 174 Available from NTIS: price code A02
An apparatus and method are disclosed for determining the effects of exposure of oxygen plasma on a thin film polymer whose bulk is maintained at a predetermined temperature. The apparatus includes a chamber having a specimen therein. A plasma environment is provided in the chamber. A closure member is provided for sealing the chamber after the specimen is introduced into the chamber. The closure member also serves as a support for the test apparatus which includes a cooling coil. A platform having the test specimen thereon is supported on the cooling coil to be cooled by coolant flowing through the cooling coils. A thermoelectric module is supported on the platform to assist in maintaining a low test temperature for the test samples. The temperature of the sample is monitored by a thermocouple probe which is in contact with the sample. Any change in bulk sample temperature caused by the thermocouple probe is quickly adjusted to maintain the initial bulk temperature by the thermoelectric module.

Method and Apparatus for Positioning a Robotic End Effector
See 0502

Method and Apparatus for Testing Materials Using Strain and Moisture Sorption
See 0564

Method and Apparatus for Testing Materials Using Strain and Moisture Sorption
See 0607

Method and system for improved resolution of a compensated calorimeter detector
See 0910

Method for Assessment of Corrosion Activity in Reinforced Concrete
See 0122

Method of Detecting Oil Spills at Sea Using a Shipborne Navigational Radar
See 0199

Method of Locating Underground Mine Fires
See 0832

Method of Radiographic Inspection of Wooden Members
See 0489

Method to Image High Speed Events Using a Standard Video Camera
See 0348

Microviscometer
See 0114

0430 Monitoring System and Method for Nuclear Weapons Effects Detection and Damage Assessment
C. L. Christianson, J. S. Hall
Department of the Navy, Washington, DC
Filed 8 Jul 85, patented 2 May 89 6p
PATENT-4 827 414 Available from Comm. of Patents
This patent discloses a system for detecting a nuclear weapon explosion and assessing damage there from comprising a sensor head and an electronic signal processor is disclosed. The sensor head is spherical in shape and comprises a plurality of temperature sensors at different locations on the sensor head and provide information concerning the direction of the radiation. Elapsed time between thermal pulse peaks measure yield of the weapon. A plurality of pressure sensors embedded in the sensor head measure blast overpressure. The time lapse between the temperature and pressure signals measures distance. Gamma and neutron sensors indicate the type of weapon

and radiation hazard. The electronic signal processor provides the necessary calculations.

Monolithic Multichannel Detector Amplifier Arrays and Circuit
See 0352

Monolithic Optical Programmable Spectrograph (MOPS)
See 0876

Multi-Channel Acoustic Simulator
See 0182

0431 Multiple channel programmable coincidence counter
G. J. Arnone
Los Alamos National Lab., NM.; Department of Energy, Washington, DC
Filed 27 Feb 89 20p
PAT-APPL-7-315 871 Available from NTIS: price code A03
A programmable digital coincidence counter having multiple channels and featuring minimal dead time. Neutron detectors supply electrical pulses to a synchronizing circuit which in turn inputs derandomized pulses to an adding circuit. A random access memory circuit connected as a programmable length shift register receives and shifts the sum of the pulses, and outputs to a serializer. A counter is input by the adding circuit and downcounted by the serializer, one pulse at a time. The decoded contents of the counter after each decrement is output to scalers.

Noise-Suppressing Hydrophones
See 0522

0432 Non-contact contour gage
L. F. Bieg
Rockwell International, Golden, CO. Rocky Flats Plant.; Department of Energy, Washington, DC
Filed 9 Feb 89 29p
PAT-APPL-7-308 074 Available from NTIS: price code A03
A fluid probe for measuring the surface contour of a machined part is provided whereby the machined part can remain on the machining apparatus during surface contour measurement. A measuring nozzle in a measuring probe directs a measuring fluid flow onto the surface. The measuring nozzle is on the probe situated midway between two guide nozzles that direct guide fluid flows onto the surface. When the guide fluid flows interact with the surface, they cause the measuring flow and measuring probe to be oriented perpendicular to the surface. The measuring probe includes a pressure chamber whose pressure is monitored. As the measuring fluid flow encounters changes in surface contour, pressure changes occur in the pressure chamber. The surface contour is represented as data corresponding to pressure changes in the pressure chamber as the surface is scanned. 4 figs.

0433 Noncontact Temperature Pattern Measuring Device
D. D. Elleman, J. L. Allen, M. C. Lee
National Aeronautics and Space Administration, Pasadena, CA. Pasadena Office
Filed 23 Feb 88, patented 20 Jun 89 11p
PATENT-4 840 496 Available from Comm. of Patents
Laser pyrometer techniques are utilized to accurately image a true temperature distribution on a given target without touching the target and without knowing the localized emissivity of the target. The pyrometer utilizes a very high definition laser beam and photodetector, both having a very narrow focus. The pyrometer is mounted in a mechanism designed to permit the pyrometer to be aimed and focused at precise localized points on the target surface. The pyrometer is swept over the surface area to be imaged, temperature measurements being taken at each point of focus.

Nondestructive material characterization
See 0616

Nonintrusive Method and Apparatus for Monitoring the Cure of Polymeric Materials
See 0084

O-Ring Gasket Test Fixture
See 0490

Optical Fiber for Magnetostrictive Responsive Detection of Magnetic Fields
See 0361

Optical Paramagnetic/Diamagnetic Gas Sensor
See 0046

Passive Stabilization of a Fiber Optic Nonlinear Interferometric Sensor
See 0366

Piezoelectric Apparatus and Process for Detection of Insect Infestation in an Agricultural Commodity
See 0026

0434 Precision contour gage
L. F. Bieg
Rockwell International, Golden, CO. Rocky Flats Plant.; Department of Energy, Washington, DC
Filed 9 Feb 89 32p
PAT-APPL-7-308 336 Available from NTIS: price code A03
An apparatus for gaging the contour of a machined part includes a rotary slide assembly and a linear probe assembly supported by the rotary slide assembly. The linear probe assembly is comprised of a suspension arm and a tip assembly including a probe tip for contacting the part. The suspension arm is supported by the rotary slide assembly and includes a slider portion which is capable of sliding upon a complementary rail located on a rotating platform at the top of the rotary slide assembly. By engagement of the slider with the rail, the linear probe assembly is capable of being positioned with respect to the rotary slide assembly. Repositioning is required when a concave part to be measured is substituted for a convex part or vice versa. A kinematic mount supports the entire contour gaging apparatus. A motor drives the rotary slide assembly, and the motor is controlled by a numerical control apparatus. The rotation of the rotary slide assembly is measured by a digital encoder. The probe tip provides a measure of linear displacement of the tip on the surface of the part. As the rotary slide assembly rotates and as the probe tip contact the part, a series of actual data points are generated representing the actual contour of the part. In a numerical controller, the actual contour is compared with a stored ideal contour, and a disparity between the two is calculated. In real-time, the settings of the machining apparatus may be adjusted by the numerical controller, and additional machining operations can continue until the actual contour is as close to the ideal contour as desired. 4 figs.

Pressure Sensitive Optical Fiber Having Optimized Coatings
See 0185

0435 Pyroelectric Calorimeter
W. A. Hagins, S. Yoshikami
Department of Health and Human Services, Washington, DC
Filed 2 Feb 89, patented 10 Jul 90 2p
PATENT-4 940 896 Available from Comm. of Patents
A pyroelectric detector comprises a support member having a tapered through-hole therein, a first polyester film positioned on said support member, across said through-hole, an aluminum foil member located on an opposite side of said polyester film from said support member, a pyroelectric film located on an opposite side of said aluminum foil member from said first polyester film, at least one additional polyester film located on an opposite side of said pyroelectric film from said aluminum foil member, and two pyroelectrical leads connected to opposite sides of said pyroelectric film.

Quantitative Surface Temperature Measurement Using Two-Color Thermographic Phosphors and Video Equipment
See 0940

0436 Radial Arm Strike Rail
M. McKeown, S. Beason
Department of the Interior, Washington, DC
Filed 31 Aug 89 13p
PAT-APPL-7-401 390 Available from NTIS: price code A03
The radial arm strike rail assembly is a system for measurement of bearings, directions, and stereophotography for geologic mapping, particularly where magnetic compasses are not appropriate. The radial arm, pivoting around a shaft axis, provides a reference direction determination for geologic mapping and bearing or direction determination. The centerable and levelable pedestal provide a base for the radial arm strike rail and the telescoping camera pedestal. The telescoping feature of the radial arm strike rail allows positioning the end of the rail for strike direction or bearing measurement with a goniometer.

Radiosonde
See 0841

Reflection Technique for Thermal Mapping of Semiconductors
See 0294

0437 Scanning Scattering Microscope with Hemispherical Mirror and Microfocused Beam
J. Fine, D. Marton
Department of Commerce, Washington, DC
Filed 21 Jul 89, patented 4 Sep 90 12p
PATENT-4 954 722 Available from Comm. of Patents
A method and apparatus produce two-dimensional micrographs of the overall surface microtopography of a given specimen by using a photodetector to measure the off-specularly reflected light from a focussed light beam which is projected through a hemispherical mirror onto the specimen surface as the specimen surface is scanned by the focused beam of light. Scanning can be accomplished either by moving the specimen surface as a result of moving the sample holding member or by moving the focused beam of light by means of a light beam deflection device.

0438 Selectable Radius, Compound Eddy Current Probe Statement of Government Interest
S. N. Vernon, B. Sircus, P. M. Gammell
Department of the Navy, Washington, DC
Filed 26 Mar 90 17p
PAT-APPL-7-498 883 Available from NTIS: price code N03
This patent application discloses a compound eddy current probe comprising a nest of concentric ferrite cup core probes. Each ferrite probe within the nest has a different radius which is switch-selected by operator or automatic program to correspond with the size and thickness of the material under test.

Semi-Automatic Direction Finding Set
See 0941

Sensor Based on a Tunneling Tip Detector
See 0623

Shallow Water Environmental/Oceanographic Measurement System
See 0527

0439 Single Zone Lighting Controller
W. Pierpoint, D. M. Weeks
Department of the Navy, Washington, DC
Filed 24 Jul 84 6p
PATENT-4 461 977 Available from Comm. of Patents
The single zone lighting controller controls the lights in a zone or area by integrating external control signals for daylighting and occupancy with a local override function. The daylighting signal is from a master photoelectric control, and occupancy signal is from a time-clock or electronic occupancy sensor; the local override, activated by an occupant provides a fixed override period before the single zone lighting controlled again responds to the external control signals. Shortly before the override period is over, the single zone lighting controller warns the occupant, e.g., by blinking the lights that the override is about to end. Patents.

0440 Skin Friction Balance
T. Ping, F. H. Supplee
National Aeronautics and Space Administration, Hampton, VA. Langley Research Center
Filed 23 Jun 88, patented 6 Jun 89 9p
PATENT-4 836 035 Available from Comm. of Patents
A skin friction balance uses a parallel linkage mechanism to avoid inaccuracies in skin friction measurement attributable to off-center normal forces. The parallel linkage mechanism includes a stationary plate mounted in a cage, and an upper and lower movable plate which are linked to each other and to the stationary plate throught three vertical links. Flexure pivots are provided for pivotally connecting the links and the plates. A sensing element connected to the upper plate moves in response to skin friction, and the lower plate moves in the opposite direction of the upper plate. A force motor maintains a null position of the sensing element by exerting a restoring force in response to a signal generated by a linear variable differential transformer

Soil Erodibility Testing
See 0124

Sound Attenuation Apparatus
See 0923

Stabilized Suspension for Immersible Apparatus
See 0528

System for Analyzing Entrained Solids Such as Cotton or Seed
See 0034

System for Detection of Transducer Defects
See 0272

Tensile Film Clamps and Mounting Block for the Rheovibron and Autovibron Viscoelastometer
See 0479

Thimble Glass Frit Nebulizer and Method
See 0052

Three-Dimensional Laser Velocimeter Simultaneity Detector
See 0926

Torque Calibrator
See 0480

0441 Torsional Suspension System for Testing Space Structures
W. H. Reed, R. R. Gold
National Aeronautics and Space Administration, Hampton, VA. Langley Research Center
Filed 26 May 89 12p
PAT-APPL-7-357 757 Available from NTIS: price code A03
A low frequency torsional suspension system for testing a space structure uses a plurality of suspension stations attached to the space structure along the length thereof in order to suspend the space structure from an overhead support. Each suspension station includes a disk pivotally mounted to the overhead support, and two cables which have upper ends connected to the disk and lower ends connected to the space structure. The two cables define a parallelogram with the center of gravity of the space structure being vertically beneath the pivot axis of the disk. The vertical distance between the points of attachment of the cables to the disk and the pivot axis of the disk is adjusted to lower the frequency of the suspension system to a level which does not interfere with frequency levels of the space structure, thereby enabling accurate measurement.

Underwater Object Detection System
See 0186

Universal single point liquid level sensor
See 0384

UV absorption control of thin film growth
See 0545

Vibration Analyzer
See 0138

0442 Zero-G Phase Detector and Separator
S. J. Schneider
National Aeronautics and Space Administration, Cleveland, OH. Lewis Research Center
Filed 21 Mar 89, patented 27 Mar 90 7p
PATENT-4 911 738 Available from Comm. of Patents
The gaseous phase is detected and then separated from a liquid phase in a fluid. This is accomplished by centrifuging the liquid phase while the gaseous phase migrates to the axis. When the expected phase is detected at a predetermined port, a signal is generated to open the liquid or gas valve at the respective outlet ports and to modulate these valves in such a manner as to withdraw fluid at the same volume rate at which it is admitted.

MACHINERY & TOOLS

0443 Active Lag Angle Device
T. L. Hester
Department of the Army, Washington, DC
Filed 2 Apr 90 7p
PAT-APPL-7-502 968 Available from NTIS: price code N03
An active lag angular device is provided in which an electric torque motor is mounted and has a rotary shaft that is connected to a reference surface structure for rotating the reference surface structure about an axis of rotation that coincides with the axis of the rotator of the motor. The reference surface structure has pulleys mounted thereon so that an optical fiber can approach the active lag angle device at a guide pulley along an axis that coincides with the axis of the rotator shaft of the motor and be turned by the pulleys and directed along a substantially constant position relative to the reference surface structure. Patent applications.

0444 Articulated Suspension System
D. B. Bickler
National Aeronautics and Space Administration, Pasadena, CA. Pasadena Office
Filed 21 Apr 88, patented 20 Jun 89 7p
PATENT-4 840 394 Available from Comm. of Patents
The invention provides a rough terrain vehicle which maintains a substantially constant weight, and therefore traction, on all wheels, despite one wheel moving considerably higher or lower than the others, while avoiding a very soft spring suspension. The vehicle includes a chassis or body to be supported and a pair of side suspensions at either side of the body. In a six wheel vehicle, each side suspension includes a middle wheel, and front and rear linkages respectively coupling the front and rear wheels to the middle wheel. A body link pivotally connects the front and rear linkages together, with the middle of the body link rising or falling by only a fraction of the rise or fall of any of the three wheels. The body link pivotally supports the middle of the length of the body. A transverse suspension for suspending the end of the body on the side suspensions includes a middle part pivotally connected to the body about a longitudinal axis and opposite ends each pivotally connected to one of the side suspensions along at least a longitudinal axis.

0445 Automatic Centering Servo Actuator
R. A. Hannmann, J. F. Higginbotham
Department of the Navy, Washington, DC
Filed 30 Aug 82, patented 7 May 85 20p
PATENT-4 515 065 Available from Comm. of Patents
A high resolution servo actuator is responsive to an electronic control or a manual control. An output shaft having fast response and infinite positioning for stroking a manual servo valve on a pump is rotated by hydraulic power. A set of hydraulic working cylinders and centering cylinders are connected through a rack and pinion drive to a shaft. Centering cylinders utilize stop tubes to prevent its pistons from traveling past the center position and applying a constant force to center the shaft. A directional valve controls the flow of hydraulic fluid to the working cylinders for driving the shaft throughout its range of travel. An electrohydraulic servo valve converts the electronic control signal into hydraulic flow to the actuator. Shaft position feedback is developed and connected to the electronic control. Patents.

0446 Compact Drill Sampler for Quantitation of Microorganisms in Wood
J. Dutkienwicz
National Institutes of Health, Bethesda, MD
Filed 6 Feb 90 27p
PAT-APPL-7-474 923 Available from NTIS: price code N03
The invention relates to apparatus and methods for obtaining wood samples for analysis. In particular, the invention relates to apparatus and methods for obtaining, preparing and analyzing wood samples for microbial contaminates. Stored wood is often colonized by bacteria and fungi which degrade the condition of the wood and also create potential health hazards for woodworkers who are exposed to inhalation of the sawdust contaminated with microorganisms and their products. Airborne wood dust may contain bacterial and fungal allergens, endotoxins produced by gram-negative bacteria, and tremorgenic mycotoxins which can cause immunopathogenic changes and pulmonary diseases in exposed individuals.

Concave Drag Bit Cutter Device and Method
See 0827

0447 Docking Mechanism for Spacecraft
G. A. Lange, J. P. Mcmanamen, J. A. Schliesing
National Aeronautics and Space Administration, Houston, TX. Lyndon B. Johnson Space Center
Filed 30 Dec 88, patented 22 Aug 89 24p
PATENT-4 858 857 Available from Comm. of Patents
A system is presented for docking a space vehicle to a space station where a connecting tunnel for in-flight transfer of personnel is required. Cooperable coupling mechanisms include docking rings on the space vehicle and space station. The space station is provided with a tunnel structure, a retraction mechanism, and a docking ring. The vehicle coupling mechanism is designed to capture the station coupling mechanism, arrest relative spacecraft motions while limiting loads to acceptable levels, and then realign the spacecraft for final docking and tunnel interconnection. The docking ring of the space vehicle coupling mechanism is supported by linear attentuator actuator devices, each of which is controlled by a control system which receives loading information signals and attenuator stroke information signals from each device and supplies output signals for controlling its linear actuation to attenuate impact loading or to realign the spacecraft for final docking and tunnel interconnection. The retraction mechanism is used to draw the spacecraft together after initial contact and coupling. Tunnel trunnions, cooperative with the latches on the space vehicle constitute the primary structural tie between the spacecraft in final docked configuration.

0448 Double Swivel Toggle Release
G. L. King, W. C. Schneider
National Aeronautics and Space Administration, Houston, TX. Lyndon B. Johnson Space Center
Filed 23 Feb 89, patented 12 Sep 89 8p
PATENT-4 864 910 Available from Comm. of Patents
A pyrotechnic actuated structural release device is disclosed which is mechanically two fault tolerant for release. The device comprises a fastener plate and fastener body each attachable to one of a pair of structures to be joined. The fastener plate and the fastener body are fastened by a dual swivel toggle member. The toggle member is supported at one end on the fastener plate and mounted for universal pivotal movement thereon. Its other end is received in a central opening in the fastener body, and has a universally mounted retainer ring member. The toggle member is restrained by three retractable latching pins symmetrically disposed in equiangular spacing about the axis of the toggle member and positionable in latching engagement with the retainer ring member on the toggle member. Each pin is retractable by a pyrotechnic charge, the expanding gases of which are applied to a pressure receiving face on the latch pins to effect retraction from the ring member. While retraction of all three pins releases the ring member, the fastener is mechanically two fault tolerant since the failure of any single one or pair of the latch pins to retract results in an asymmetrical loading on the ring member and its dual pivotal movement ensures a release.

0449 Double Valve Mechanism for an Acoustic Modulator
R. B. Anderson
Department of the Navy, Washington, DC
Filed 23 Aug 89, patented 16 Jan 90 9p
PATENT-4 893 655 Available from Comm. of Patents
A double valve mechanism which is the functioning part of an acoustic modulator which regulates airflow by creating air pressure variations. A pair of cylindrical shaped members, each of which has a plurality of elongated ports therein move relative to each other through electro-magnetic excitation. The motion of the two cylindrical shaped members is reciprocating causing the ports to first open and then close, thereby modulating the air flowing through the acoustic modulator. Linear motion of the cylindrical shaped members to displace the same port area is only one half of the linear motion required in a previous design, resulting in an acoustic energy output waveform having a frequency which is double the frequency of an electrical sinusoidal input signal supplied to the acoustic modulator. Patents.

0450 Elastomeric Mount for Thrust Bearing Shoe
J. D. Spargo, J. W. White
Department of the Navy, Washington, DC
Filed 30 Dec 88, patented 9 Jan 90 5p
PATENT-4 892 417 Available from Comm. of Patents
An elastomeric mount for a thrust bearing shoe comprising a piston fluidly operative in a platform cavity, the piston is isolated and sealed from the cavity by an elongated elastomeric bearing-seal. The piston lockingly engages a thrust shoe with a compound dovetail connection whereby the shoe may be installed and removed after the piston and elastomeric bearing-seal are bonded into the platform cavity. Keywords: Patents; PAT-CL-384.99.

0451 Electronic Precipitator Control
D. F. Johnston
National Aeronautics and Space Administration, Hampton, VA. Langley Research Center
Filed 14 May 86, patented 22 Aug 89 8p
PATENT-4 605 424 Available from Comm. of Patents
A method and apparatus for controlling power to a precipitator are disclosed. After each spark the power to the precipitator is reduced to zero, increased along a fast ramp for a fixed period of time and then increased along a slow ramp until a spark occurs. The fast and slow ramp data is computed and stored (memory) and then retrieved after each spark. The data retrieved is the data corresponding to the firing angle at the last spark. Apparatus is provided (selector and memory) for dividing (frequency divider) the retrieved slow ramp data by a number to select the number of sparks per minute. Also the ac current and the ac voltage in the power to the precipitator are detected and the RMS values are obtained and compared and if the differ-

ence is above a predetermined value the power is disconnected.

0452 Electrostatically Suspended Rotor for Angular Encoder
W. Polstorff
National Aeronautics and Space Administration, Huntsville, AL. George C. Marshall Space Flight Center
Filed 21 Aug 89 35p
PAT-APPL-7-396 262 Available from NTIS: price code A03
An apparatus for engraving a code strip with coded markings is disclosed. The code strip is attached for rotation to a cylindrical rotor which is mounted within the cavity of a stator. The stator carries electrodes on its top and side walls to which high potentials are applied to electrostatically suspend the rotor. Circuit means sense the position of the rotor with respect to the stator electrodes and adjust the potential to maintain the rotor at its desired location. A drive motor is connected to the rotor through a drive shaft to initially lift the rotor into the desired location within the stator and to rotate it at the desired speed. Thereafter, the drive shaft is disconnected from the rotor, and the rotor continues to spin at a highly stable angular velocity, supported only by the electrostatic fields.

0453 Extreme pressure fluid sample transfer pump
J. E. Halverson, W. W. Bowman
Du Pont de Nemours (E.I.) and Co., Aiken, SC.; Department of Energy, Washington, DC
Filed 8 Jun 89 14p
PAT-APPL-7-362 993 Available from NTIS: price code A03
A transfer pump for samples of fluids at very low or very high pressures comprising a cylinder having a piston sealed with an O-ring, the piston defining forward and back chambers, an inlet and exit port and valve arrangement for the fluid to enter and leave the forward chamber, and a port and valve arrangement in the back chamber for adjusting the pressure across the piston so that the pressure differential across the piston is essentially zero and approximately equal to the pressure of the fluid so that the O-ring seals against leakage of the fluid and the piston can be easily moved, regardless of the pressure of the fluid. The piston may be actuated by a means external to the cylinder with a piston rod extending through a hole in the cylinder sealed with a bellows attached to the piston head and the interior of the back chamber. 2 figs.

0454 Fabrication of Low Frequency Structureborne Vibration Isolation Mount
V. N. Fazi, R. G. Murdock, E. O. Hancock, J. W. McCready
Department of the Navy, Washington, DC
Filed 28 Nov 88, patented 20 Mar 90 4p
PATENT-4 908 929 Available from Comm. of Patents
A low frequency structureborne vibration isolation mount is described. It includes an annular disk pad for vibration damping material which is sandwiched and bonded between two similar light but rugged annular disks. The annular disk pad and the two annular disks have equal number of matching and corresponding holes along the circumferences thereof. The sizes of the holes are so chosen that one of the annular disks can be secured to the moving piece of equipment and isolated from everything else and the other annular disk can be secured to the stationary piece of equipment. The vibrations of the moving piece of equipment are thus isolated from everything else. Patents.

0455 Fluidic Gain Changer
R. L. Woods
Department of the Navy, Washington, DC
Filed 18 Apr 83, patented 6 Mar 84 5p
PATENT-4 434 812 Available from Comm. of Patents
A fluidic gain changer uses a fluid jet to mechanically deflect between two sets of fluidic receivers. A planar fluidic amplifier has its power jet, control jets and interaction regions bounded together to form a flexible tab that can be deflected in the third dimension. Two sets of receivers are located downstream and are offset so that the jet is evenly divided into the two sets of receivers when the tab is centered. Deflection of the tab increases the gain in one set of receivers while decreasing the gain in the other set of receivers. Patents.

0456 Fully Articulated Four-Point-Bend Loading Fixture
A. M. Calomino
National Aeronautics and Space Administration, Cleveland, OH. Lewis Research Center
Filed 28 Dec 89 11p
PAT-APPL-7-458 274 Available from NTIS: price code N03
A fully articulated four-point bend loading fixture for Modulus of Rupture (MOR) and fracture toughness specimens utilizes an upper loading plate in combination with a lower loading plate. The lower plate has a pair of spring loaded ball bearings which seat in V-shaped grooves located in the upper plate. The ball bearings are carried in the arms of the lower plate. A load is applied to the specimen through steel rollers, one large roller and one smaller roller each located on both the upper and lower plates. The large rollers have needle roller bearings which enable a single loading roller to rotate relative to the plate to which it is attached.

0457 Garment Pressurizing Apparatus
W. N. Werner, J. K. Biscardi, E. L. McClain
Department of the Navy, Washington, DC
Filed 30 Aug 88, patented 12 Dec 89 5p
PATENT-4 885 930 Available from Comm. of Patents
Prior to pressurizing a garment at an opening therein, interior and exterior elements are drawn together along the longitudinal axis of a tube through which the pressurizing gas is applied, to grip the garment around the full periphery of that opening. In one particular embodiment, a means for monitoring pressure within the garment is included in the apparatus to provide for leak testing the garment after it is pressurized. Patents. Leak detectors.

0458 Gripping Device
G. F. Parma
National Aeronautics and Space Administration, Houston, TX. Lyndon B. Johnson Space Center
Filed 19 Jul 88, patented 22 Aug 89 11p
PATENT-4 858 979 Available from Comm. of Patents
This invention relates to a gripping device, and more particularly to one with a large moment carrying capability for handling long workpieces of various diameters and which can be particularly used as an end effector on a robotic arm.

0459 Hot Air Heat Gun
T. L. Poston
Department of the Navy, Washington, DC
Filed 23 Oct 89 8p
PAT-APPL-7-425 663 Available from NTIS: price code N03

The invention relates generally to the art of self-contained heating devices and in particular to portable heating devices employing chemical reaction to produce heat. Currently, hand-held heat sources, capable of producing heat at a sufficiently high temperature to activate heat-shrink material, rely on either the combustion of flammable material or electrical power to provide energy for generating the required heat. An object of the present invention is to provide a portable device capable of providing sufficient heat to shrink heat-shrinkable tubing. A further object of the invention is to provide a non-flammable heat source suitable for use in the presence of explosive atmospheres. Still another object of the invention is to provide a portable hand-held device for generating heat which can be directed to a specific location on a work surface. Patent applications.

0460 Hybrid Butterfly Valve
L. Dequay
National Aeronautics and Space Administration, Huntsville, AL. George C. Marshall Space Flight Center
Filed 7 Sep 89 15p
PAT-APPL-7-404 292 Available from NTIS: price code N03
A hybrid butterfly valve has a stationary seat and a valve closure disk which may rotate together with an actuating shaft from the fully open position to a position wherein the disk is aligned with the seat, and may be moved linearly into a sealing relationship with the seat. The disk is supported by brackets having an elongated slot through which the shaft extends, the brackets being adapted to move linearly relative to the shaft. Cams fastened to the shaft initiate a 90 degree rotation of the disk from the fully open position to the position where the valve disk is aligned with the seat, and the cams act in conjunction with followers carried by the disk to move the disk and the brackets linearly. The disk carries guide members which are positioned in a guide slot, the guide slot having an arcuate portion and a linear portion, and the disk is guided by the guide members guided in the arcuate portion when the disk is fully opened to and until the disk is aligned with the seat, and the guide members are guided by the linear portion of the slot. A portion of each cam is spring biased so that the cams tightly engage follower rollers carried by the brackets during the rotational portion of the movement of the disk.

In-line rotating torque sensor with on-board amplifier background of the invention
See 0330

0461 Jam Resistant Fluid Power Actuator for Ballistic-Damage Tolerant Redundant Cylinder Assemblies
J. W. Holtrop
Department of the Navy, Washington, DC
Filed 26 Nov 84, patented 19 Sep 89 7p
PATENT-4 867 044 Available from Comm. of Patents
This patent discloses a hydraulic actuator having redundant cylinder assemblies, each assembly being of lightweight and economical construction in having a relatively thin tubular wall reinforced to withstand hydraulic pressure by a layer of resin reinforced filament, the thickness and the material of the wall being such that petals formed from the wall by projectile penetration are sheared by engagement with a piston of the assembly as this piston is moved, together with an actual element, by the piston of the other assembly. Ammunition damage tolerance; Patents.

Low Force Cable Disconnect
See 0520

0462 Mechanical Strain Isolator Mount
G. E. James
National Aeronautics and Space Administration, Hampton, VA. Langley Research Center
Filed 27 Nov 89 7p
PAT-APPL-7-441 673 Available from NTIS: price code N03
Certain devices such as optical instruments must preserve their alignmental integrity while being subjected to mechanical strain. A mechanical strain isolator mount is provided to preserve the alignmental integrity of an alignment sensitive instrument. An alignment sensitive instrument is mounted on a rectangular base. Flexural legs are connected at their proximal ends to the rectangular base. Flexural legs are also spaced parallel to the sides. Mounting pads are connected to the legs at the distal end and the mechanical strain isolator mount is attached to the substrate by means of threaded bolts. When a mounting pad and its respective leg is subjected to lateral strain in either the X or Y direction via the substrate, the respective leg relieves the strain by bending in the direction of the strain. An axial strain on a mounting pad in the Z direction is relieved by a rotational motion of the legs in the direction of the strain. When the substrate is stress free, the flexural legs return to their original condition and thus preserve the original alignment integrity of the alignment sensitive instrument.

0463 Mechanism for Proportionately Loading Dual Thrust Bearing Assemblies against Axial Thrust Loads
J. W. Henry
Department of the Navy, Washington, DC
Filed 12 Mar 84, patented 15 Jan 85 9p
PATENT-4 493 514 Available from Comm. of Patents
A mechanism is described for distributing axial thrust loads acting on a rotating shaft, including dual thrust bearing assemblies concentrically mounted on the rotating shaft for transmitting axial thrust loads to the thrust load distributing mechanism. The thrust load distributing mechanism includes a stationary support member having at least one fulcrum to provide a reaction force to counter-balance the axial thrust loads acting on the rotating shaft, an annular load lever cooperating with each of the at least one fulcrum, at least two thrust transfer members cooperating with first and second segments on the annular load lever and the dual thrust bearing assemblies, and a force transmitting means. In the preferred embodiment two annular load levers are centered on first and second fulcrums, respectively, a first thrust loads alternately through, respectively, and a first thrust member, or second and third thrust members and the force transmitting means, to first and second segments of the opposite annular load lever such that the axial thrust loads are transmitted to the opposite annular load lever equidistantly with respect to the opposite fulcrum and the reaction force produced in the fulcrum counterbalances the axial thrust load acting on the rotating shaft. Patents.

0464 Mechanized Fluid Connector and Assembly Tool System
R. C. Zentner, S. A. Smith
National Aeronautics and Space Administration, Houston, TX. Lyndon B. Johnson Space Center
Filed 9 Nov 89 16p
PAT-APPL-7-433 881 Available from NTIS: price code N03
A fluid connector system is disclosed which includes a modified plumbing union having a rotatable member for

drawing said union into a fluid tight condition. A drive tool is electric motor actuated and includes a reduction gear train providing an output gear engaging an integral peripheral spur gear on the rotatable member. Coaxial alignment means are attached to both the connector assembly and the drive tool. A hand lever actuated latching system includes a plurality of circumferentially spaced latching balls selectively wedged against the alignment means attached to the connector assembly or to secure the drive tool with its output gear in mesh with the integral peripheral spur gear. The drive motor is torque, speed, and direction controllable.

Method and Apparatus for Positioning a Robotic End Effector
See 0502

Method of Enhancing Rock Fragmentation and Extending Drill Bit Life
See 0831

0465 Motion Translator
J. R. Kovar
Department of the Navy, Washington, DC
Filed 4 Jan 89, patented 28 Nov 89 7p
PATENT-4 882 970 Available from Comm. of Patents
The patent discloses a motion translating device for receiving a force input from one direction and translating it mechanically by combined linear and rotational components into a resultant motion is a different direction. The apparatus consists of a slotted frame member having a base for mounting to another object such as an airborne weapon and a pair of separated, parallel and vertical walls extending upwards from the base. A slotted slide member is movably contained between the two walls so that when a generally horizontal force is applied to one end of that member by way of a cable connected between that other object and said one end of the slide member, the slide member is caused to move forward thru the frame member while simultaneously its opposite end is caused to rotate upwards away from the frame member. A device linked to that latter end will thus be lifted and simultaneously rotated so that its longitudinal axis initially normal to the longitudinal axis of the other object is finally parallel to that axis when the device is lifted out of its stored position within that other object.

0466 Multi-Element Spherical Shell Generation
A. D. Morrison
National Aeronautics and Space Administration, Pasadena, CA. Pasadena Office
Filed 28 Sep 88, patented 20 Feb 90 7p
PATENT-4 902 450 Available from Comm. of Patents
A nozzle assembly in a multi-element spherical shell generation system includes first and second side-by-side spaced apart nozzles and a web portion extending between and connecting the nozzles. The first nozzle has an inner orifice adapted to discharge a first filler material and an outer annular orifice separated from and defined in concentric relation about the inner orifice and adapted to discharge a first shell material. The second nozzle has an inner orifice adapted to discharge a second filler material and an outer annular orifice separated from and defined in concentric relation about the inner orifice and adapted to discharge a second shell material. A multi-element spherical shell can be formed through employment of the nozzle assembly by merger with one another after discharge from the outer orifices of the nozzles of a pair of adjacent annular streams of liquid or molten shell wall material of different compositions and encapsulation by the mixed shell wall materials of a common encapsulated core fluids also simultaneously discharged by the inner orifices nozzles. On the other hand, the pair of encapsulating streams of shell wall material can be of the same materials which merge together and encapsulate core fluids of different compositions which will merge together after discharge from the nozzles.

0467 Multi-Post Yoke Gimbal
D. B. Forman
Department of the Navy, Washington, DC
Filed 14 Sep 88, patented 24 Apr 90 7p
PATENT-4 919 382 Available from Comm. of Patents
A multi-post gimbal mechanism for imparting motion to an object about a center of rotation including a frame for supporting the object and a plurality of elongated posts coupled to the frame so as to permit orbital rotation of the frame about each of the coupling points. Each of the elongated posts is selectively adjustable in position and drive means are coupled to the elongated posts to selectively adjust the position. The drive means are supported on a mounting base and are pivotally attached to the mounting base such that each drive mechanism can rotate about an axis that is orthogonal to the longitudinal axis of its corresponding elongated support post. Patents.

0468 Nonvolatile, Fast Response Wire Cutter
C. R. Cherry
Department of the Navy, Washington, DC
Filed 2 Oct 89 19p
PAT-APPL-7-415 736 Available from NTIS: price code N03
The invention relates to the field of performing mechanical motion from a stand-off distance. In particular, for providing mechanical shearing or percussion detonation, without the use of explosives. It is especially useful when the mechanical motion must be exactly or precisely timed, such as is required for cutting wires when disarming sophisticated improvised explosive devices. The objects and advantages of the present invention are obtained by using one or more strands of shock tube which then propels one or more pistons down one or more barrels to perform mechanical functions. This invention discloses a device that remotely performs mechanical work functions, and remotely severs wires. It can be safely employed adjacent to the most sensitive commercial dynamites. The wire cutter has a fast response time; that is, it severs wires in microseconds with a simultaneously of severance time in less than 250 microseconds. The device performs pyrotechnic ignition and mechanical work functions required in theatrical special effects safely without the need for explosive detonators or high pressure squibs. This method of wire cutting can engage multiple cutters as needed. The system of Explosive Ordnance Disposal (EOD) wire cutting is reusable, and the device is low cost and constructed from readily available off-the-shelf parts. Patent applications.

0469 Payout Tension Control System for Reel Mounted Cable
G. B. Winkler
Department of the Navy, Washington, DC
Filed 29 May 90 10p
PAT-APPL-7-529 294 Available from NTIS: price code N03
This invention relates generally to the withdrawal or payout of flexible cable under tensile loading from a storage reel, and more particularly to control over such payout. Payout of cable from a storage reel in mine mooring systems associ-

ated with marine vessels, for example, is often plagued by cable damage problems caused by excessive tensile loading. In such installations, the mooring cable is tightly and precisely wound on the storage reel in order to avoid cable deformation and cutting through successive layers of cable turns on the reel under tensile loading when payout is stopped. Payout is controlled by an electrically activated brake connected through a brake shaft to a payout arm that is rotated to peel the cable off a stationary reel.

0470 Plasma Gun with Coaxial Powder Feed and Adjustable Cathode
I. Zapiatynsky
National Aeronautics and Space Administration, Cleveland, OH. Lewis Research Center
Filed 7 Jul 89 12p
PAT-APPL-7-376 488 Available from NTIS: price code A03
An improved plasma gun coaxially injects particles of ceramic materials having high melting temperatures into the central portion of a plasma jet. This results in a more uniform and higher temperature and velocity distribution of the sprayed particles. The position of the cathode is adjustable to facilitate optimization of the performance of the gun wherein grains of the ceramic material are melted at lower power input levels.

0471 Pressure Balanced Floating Seal
J. D. Spargo
Department of the Navy, Washington, DC
Filed 29 Jul 83, patented 22 Jan 85 7p
PATENT-4 494 760 Available from Comm. of Patents
A shaft seal is slidably mounted in a housing with essential equal or balanced forces acting on each radial side. Fluid from the high pressure side of the shaft is communicated to equal areas on the two sides by ducts and constrained to the design areas by O rings. The seal moves radially in response to shaft displacements while maintaining a sealing relationship between packing material and the shaft. Keywords: Patents.

0472 Pressure Sensitive Release Device
W. B. Freeman
Department of the Navy, Washington, DC
Filed 25 Aug 88, patented 18 Jul 89 6p
PATENT-4 848 262 Available from Comm. of Patents
A release mechanism is triggered when the pressure differential on the sidewall of a sealed container reaches a predetermined threshold level at which the container either implodes or explodes to sufficiently decrease the spacing between the ends of the container and thereby achieve the release. False triggering due to percussion or shock waves may be precluded by disposing a shield about the sidewall. Patents.

Programmable Near-Infrared Ranging System
See 0506

0473 Releasable Clamping Apparatus
W. N. Myers
National Aeronautics and Space Administration, Huntsville, AL. George C. Marshall Space Flight Center
Filed 24 Sep 87, patented 6 Jun 89 11p
PATENT-4 836 707 Available from Comm. of Patents
In accordance with this invention, a releasable clamping apparatus was constructed having an opening or slot within which a lifting handle is clamped between retaining latch portions and a clamp assembly. The latch portions are supported by openings and are retracted and extended into a slot by spring biased linkage members. These members are acted upon by similarly profiled cam lobes. Dissimilarly profiled cam lobes of the cam member act upon the clamp assembly, clamping a hangle against faces of the latch portions. The cam member is coupled to a shaft having an operating handle with the shaft also being provided with a detent assembly. This detent assembly locks the handle and the shaft in locked positions in the surface of the apparatus, which clamps a handle as described. When the handle is rotated to position the detent assembly is one of the release openings, the clamp assembly and the latch portions are withdrawn into their respective openings, releasing the handle.

Robust High-Performance Control for Robotic Manipulators
See 0509

0474 Scuttle Valve
L. J. Martini
Department of the Navy, Washington, DC
Filed 13 Nov 87, patented 11 Jul 89 6p
PATENT-4 846 209 Available from Comm. of Patents
A scuttle valve is provided for flooding a torpedo. The scuttle valve includes a housing which is fitted through the hull of the torpedo. The housing has a bore which when vacant, serves as a port to enable water to enter the torpedo. A piston is slidably mounted within the bore of the housing and is spring biased towards the interior of the torpedo. An explosive bolt which is threaded into the piston extends through a tapered plate which cams a retainer ring across the interior end of the piston and into an interior annular recess in the housing to restrain the piston within the bore. When the explosive bolt is actuated the bolt breaks and the retainer ring contracts to allow the spring to force the piston into the interior of the torpedo. Thus, water enters through the open bore of the housing and floods the torpedo. Keywords: Patent applications; Bypass valves; Safety valves; Sampling.

Self-Feeding Wood Chunker
See 0622

0475 Sheave Assembly
E. N. Jorgensen
Department of the Navy, Washington, DC
Filed 2 Apr 90 16p
PAT-APPL-7-507 264 Available from NTIS: price code N03
The disclosure describes a sheave that has the advantage of being able to be quickly coupled to a cable, and quickly decoupled from the cable. A further advantage is that the shaft of the pulley on which the cable rides is journaled at each end in side members that interlock when the sheave is in its closed position to support the shaft both from above the pulley, and from below. Other advantages include that the interlock is an arcuate T-shaped extension in the rotatable side member and a corresponding arcuate T-slot groove with which it engages in the stationary side member. The rotatable side member is affixed to the shaft of the pulley and is operable to rotate about the shaft from its closed and interlocked position to its open and disengaged position whereat the pulley is exposed such that the cable, cord or the like may be coupled or decoupled to the pulley. In the open position the side members only are connected by way of the pulley's shaft, whereas in the closed and load bearing position the side members additionally are supported to one another by the T-slot interlock that is both above and below the pulley. A slip ring lock is included to

retain the side members in their interlocked position. Patent applications.

0476 Single Element Magnetic Suspension Actuator
N. J. Groom
National Aeronautics and Space Administration, Hampton, VA. Langley Research Center
Filed 11 Sep 89 16p
PAT-APPL-7-405 154 Available from NTIS: price code N03
The invention, a single element magnetic suspension actuator with bidirectional force capability along a single axis, includes an electromagnet and a nonmagnetic suspended element. A permanent magnet mounted on the suspended element interacts with a magnetic field established by the electromagnet to produce bidirectional forces in response to a variable force command voltage V(sub FC) applied to the electromagnet. A sensor measures the position of the suspended element on the single axis which is a function of force command voltage V

0177 Speed control with end cushion for high speed air cylinder
W. W. Stevens, C. W. Solbrig
Argonne National Lab., IL.; Department of Energy, Washington, DC
Filed 20 Jun 89 20p
PAT-APPL-7-368 637 Available from NTIS: price code A03
A high speed air cylinder in which the longitudinal movement of the piston within the air cylinder tube is controlled by pressurizing the air cylinder tube on the accelerating side of the piston and releasing pressure at a controlled rate on the decelerating side of the piston. The invention also includes a method for determining the pressure required on both the accelerating and decelerating sides of the piston to move the piston with a given load through a predetermined distance at the desired velocity, bringing the piston to rest safely without piston bounce at the end of its complete stroke. 4 figs.

Stabilized Suspension for Immersible Apparatus
See 0528

0478 Structural Vibration and Shock Isolator
R. E. Waclawik
Department of the Navy, Washington, DC
Filed 1 Jun 89 16p
PAT-APPL-7-360 179 Available from NTIS: price code N03
This patent application os co-pending with related patent application entitled Structural Vibration and Shock Isolation in a High Pressure Environment by the same inventor filed on the same date as this application. The present invention generally relates to piping systems and more particularly a piping system wherein one end is isolated from the shock and vibration of the other end. The present invention provides structural vibration and shock isolation between inlet and outlet sections of a fluid system having high axial loads. The outlet section has flanged arrangement in which isolation material components are placed both above and below the flange. The inlet section comprises a fluid conducting pipe. Patent Application.

Surface mount component jig
See 0239

0479 Tensile Film Clamps and Mounting Block for the Rheovibron and Autovibron Viscoelastometer
D. M. Stoakley, A. K. St.Clair, B. D. Little
National Aeronautics and Space Administration, Hampton, VA. Langley Research Center
Filed 4 Nov 88, patented 12 Sep 89 8p
PATENT-4 864 865 Available from Comm. of Patents
A set of film clamps and a mounting block for use in the determination of tensile modulus and damping properties of films in a manually operated or automated Rheovibron is diagrammed. These clamps and mounting block provide uniformity of sample gripping and alignment in the instrument. Operator dependence and data variability are greatly reduced.

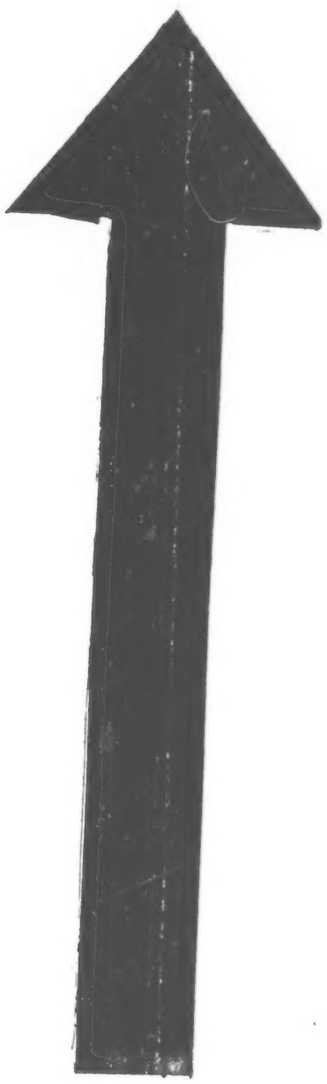
0480 Torque Calibrator
R. L. Cameron, J. S. Burgess
Department of the Air Force, Washington, DC
Filed 2 Sep 88 13p
PAT-APPL-7-239 814 Available from NTIS: price code N03
A torque calibrator which has a pair of torque beams with hydraulic cylinders for exerting forces on opposite ends of the torque beams and with load cells mounted at opposite ends of the beams for measuring the forces applied to the beams with the beams designed for a torque cell to be mounted between the beams for having torque applied to the torque cell to calibrate the torque cell. Patent applications.

0481 Trailer Shield Assembly for a Welding Torch
G. E. Dyer
National Aeronautics and Space Administration, Huntsville, AL. George C. Marshall Space Flight Center
Filed 16 Feb 88, patented 13 Jun 89 8p
PATENT-4 839 489 Available from Comm. of Patents
This invention relates generally to trailer shields for gas shielded arc welding torches, and more particularly to a trailer shield assembly provided with a shield gas manifold for providing an even dispersion of shield gas to the interior of the shield assembly, which generally encloses a joint being welded and a welding trailing portion of hot welded metal. The novelty of the invention lies in providing trailer shield with a manifold tube having a plurality of openings from which shield gas is distributed. A gas manifold region ahead of the torch is also provided with shield gas from a tube to protect metal preheated by the torch. Further novelty lies in constructing portions of sides and housing and portions of side walls of the guide of stainless steel screen having a tight mesh.

Turbomachinery Rotor Support with Damping
See 0136

Turbomachinery Shaft Insert
See 0137

0482 Universal Precision Sine Bar Attachment
F. D. Mann
National Aeronautics and Space Administration, Huntsville, AL. George C. Marshall Space Flight Center
Filed 9 Mar 88, patented 7 Mar 89 9p
PATENT-4 809 411 Available from Comm. of Patents
This invention relates to an attachment for a sine bar which can be used to perform measurements during lathe operations or other types of machining operations. The attachment can be used for setting precision angles on vises, dividing heads, rotary tables and angle plates. It can also be used in the inspection of machined parts, when close toler-



ances are required, and in the layout of precision hardware. The novelty of the invention is believed to reside in a specific versatile sine bar attachment for measuring a variety of angles on a number of different types of equipment.

MANUFACTURING & INDUSTRIAL ENGINEERING: Manufacturing Processes

0483 Dc arc weld starter
R. H. Campiotti, J. E. Hopwood
Sandia National Labs., Albuquerque, NM.; Department of Energy, Washington, DC
Filed 17 Feb 89 12p
PAT-APPL-7-311 781 Available from NTIS: price code A03
A system for starting an arc for welding uses three DC power supplies, a high voltage supply for initiating the arc, an intermediate voltage supply for sustaining the arc, and a low voltage welding supply directly connected across the gap after the high voltage supply is disconnected.

0484 Device and Method for Detecting and Displaying Crossover Pattern in Precision Winding
T. L. Hester
Department of the Army, Washington, DC
Filed 16 Apr 90 11p
PAT-APPL-7-509 112 Available from NTIS: price code N03
In precision winding of fiber, such as optical fiber or natural or synthetic fabric thread, the fiber is wound layer by layer over a tapered cylindrical bobbin. All odd layers are wound in one direction (example: from left to right) and all even layers are wound in the opposite direction (i.e. from right to left). The device and method for detecting and displaying crossover pattern in precision winding makes it possible to observe crossover patterns without stopping the winding process. A lag angle detector (LAD) is used to detect crossover occurring during a winding process. In conjunction with a suitable circuit built of a differentiator, threshold, angle counter, turn counter, status latch and data latch, the information from LAD can be used to display crossover patterns graphically on a computer monitor and enable observation of the patterns without stopping the winding process. The crossover pattern information can be stored in the computer and retrieved at a later time for underlying layers where visual inspection after completion of winding is impossible. Patent applications.

0485 Expanding Ring Joint
K. G. Whitham
Department of the Navy, Washington, DC
Filed 5 Dec 88, patented 7 Nov 89 7p
PATENT-4 878 695 Available from Comm. of Patents
This investigation relates to an apparatus and method for producing a rigid joint between two interlocked tubular members and in particular between two tubular members have cylindrical mating ends. This patent involves a joint having no external protrusions consisting of the mating cylindrical ends of two tubular members joined by interlocking cogs on the male and female ends of the tubular members, and a pair of facing ramp surfaced rings disposed in the joint with one ring integral with or affixed immovably to the male end of one tubular member, the other ring rotatably disposed upon that same member within the joint so that when the movable ring is rotated by means of a spanner wrench or equivalent tool relative to the stationary ring, the juxtaposed ramp surfaces ride upon each other causing the movable ring to move axially relative to but in continuing contact with the stationary ring until contact with the female end of the other tubular member in the joint is established and the joint is thereby made rigid. The spaces thus created between the ramps of the rings are filled with material that becomes solid or set screws radially disposed in the movable ring to engage an annular slot about the male end of the one tubular member and underlying the movable ring can be used to thereafter immobilize that ring.

0486 Flexible Extendable Backing Shield for Welding Reactive Metals
R. DeNale, W. E. Lukens, L. A. Marsh
Department of the Navy, Washington, DC
Filed 20 Apr 88, patented 12 Sep 89 4p
PATENT-4 866 236 Available from Comm. of Patents
This patent discloses a flexible extendable backing shield for use with the welding of reactive metals such as titanium. The backing shield provides a means for selectively distributing the inert gas along the length of the shield and then diffusing the inert gas to the root side of the weld to prevent oxidation and embrittlement of the weld root. The backing shield is of modular configuration so that a plurality of the devices can be readily connected together to shield a variety of complex shapes. Patents; PAT-CL-219-74.

0487 High Density Tape Casting System
E. R. Collins
National Aeronautics and Space Administration, Pasadena, CA. Pasadena Office
Filed 21 Oct 86, patented 13 Jun 89 61p
PATENT-4 839 121 Available from Comm. of Patents
A system is provided for casting thin sheets (or tapes) of particles bound together, that are used for oxygen membranes and other applications, which enables the particles to be cast at a high packing density in a tape of uniform thickness. A slurry contains the particles, a binder, and a solvent, and is cast against the inside walls of a rotating chamber. Prior to spraying the slurry against the chamber walls, a solvent is applied to a container. The solvent evaporates to saturate the chamber with solvent vapor. Only then is the slurry cast. As a result, the slurry remains fluid long enough to spread evenly over the casting surface formed by the chamber, and for the slurry particles to become densely packed. Only then is the chamber vented to remove solvent, so the slurry can dry. The major novel feature is applying solvent vapor to a rotating chamber before casting slurry against the chamber walls.

Integrated Circuit Reliability Testing
See 0282

0488 Internal Wire Guide for Gtaw Welding
G. E. Morgan, G. E. Dyer
National Aeronautics and Space Administration, Huntsville, AL. George C. Marshall Space Flight Center
Filed 5 Dec 88, patented 7 Nov 89 5p
PATENT-4 879 446 Available from Comm. of Patents
A welding torch for gas tungsten arc welding apparatus has a filler metal wire guide positioned within the torch, and within the shielding gas nozzle. The wire guide is adjacent to the tungsten electrode and has a ceramic liner through which the wire is fed. This reduces the size of the torch and eliminates the outside clearance problems that exit with external wire guides. Additionally, since the wire is

always within the shielding gas, oxidizing of the wire is eliminated.

Method for Detecting Pinholes and Incomplete Coverage of Hermetic Coatings on Optical Fiber Waveguides
See 0871

Method of Forming Low Cost, Formable High T(Subc) Superconducting Wire
See 0343

Method of Making a Long Life High Current Density Cathode from Tungsten and Iridium Powders Using a Mixture of Barium Peroxide and a Coated Emitter as the Impregnant
See 0580

Method of Making Self-Aligned GaAs/AlGaAs FET's
See 0286

0489 Method of Radiographic Inspection of Wooden Members
M. L. Berry, R. F. Berry
National Aeronautics and Space Administration, Hampton, VA. Langley Research Center
Filed 25 Nov 87, patented 6 Feb 90 6p
PATENT-4 899 356 Available from Comm. of Patents
The invention is a method to be used for radiographic inspection of a wooden specimen for internal defects which includes the steps of introducing a radiopaque penetrant into any internal defects in the specimen through surface openings; passing a beam of radiation through a portion of the specimen to be inspected; and making a radiographic film image of the radiation passing through the specimen, with the radiopaque penetrant in the specimen absorbing the radiation passing through it, thereby enhancing the resulting image of the internal defects in the specimen.

0490 O-Ring Gasket Test Fixture
J. E. Turner, D. S. McCluney
National Aeronautics and Space Administration, Huntsville, AL. George C. Marshall Space Flight Center
Filed 5 Jun 89 14p
PAT-APPL-7-361 479 Available from NTIS: price code A03
An apparatus is presented for testing O-ring gaskets under a variety of temperature, pressure, and dynamic loading conditions. Specifically, this apparatus has the ability to simulate a dynamic loading condition where the sealing surface in contact with the O-ring moves both away from and axially along the face of the O-ring.

0491 Pre-resistance-welding resistance check
D. E. Destefan, D. A. Stompro
Rockwell International, Golden, CO. Rocky Flats Plant.; Department of Energy, Washington, DC
Filed 8 Jun 89 13p
PAT-APPL-7-362 990 Available from NTIS: price code A03
A preweld resistance check for resistance welding machines uses an open circuited measurement to determine the welding machine resistance, a closed circuit measurement to determine the parallel resistance of a workpiece set and the machine, and a calculation to determine the resistance of the workpiece set. Any variation in workpiece set or machine resistance is an indication that the weld may be different from a control weld.

Produce Bagging Machine
See 0028

0492 Smart watchdog safety switch
J. W. Kronberg
Du Pont de Nemours (E.I.) and Co., Aiken, SC.; Department of Energy, Washington, DC
Filed 12 May 89 34p
PAT-APPL-7-350 953 Available from NTIS: price code A03
A method and apparatus for monitoring a process having a periodic output so that the process equipment is not damaged in the event of a controller failure, comprising a low-pass and peak clipping filter, an event detector that generates an event pulse for each valid change in magnitude of the filtered periodic output, a timing pulse generator, a counter that increments upon receipt of any timing pulse and resets to zero on receipt of any event pulse, an alarm that alerts when the count reaches some preselected total count, and a set of relays that open to stop power to process equipment. An interface module can be added to allow the switch to accept a variety of periodic output signals. 6 figs.

Soft x-ray reduction camera for submicron lithography
See 0297

Symmetrical Layered Thin Film Edge Field-Emitter-Array and Method for Its Production
See 0378

0493 Weld arc simulator
M. J. Burr
Rockwell International, Golden, CO. Rocky Flats Plant.; Department of Energy, Washington, DC
Filed 1 Mar 89 13p
PAT-APPL-7-317 494 Available from NTIS: price code A03
An arc voltage simulator for an arc welder permits the welder response to a variation in arc voltage to be standardized. The simulator uses a linear potentiometer connected to the electrode to provide a simulated arc voltage at the electrode that changes as a function of electrode position.

0494 X-Ray Source for Lithography
P. Sprangle, B. Hafizi, F. Mako
Department of the Navy, Washington, DC
Filed 9 May 90 21p
PAT-APPL-7-520 229 Available from NTIS: price code N03
This patent application discloses an x-ray lithography device in which a beam of electrons interacts with a microwave field of a quasi-optical maser such as a quasi-optical gyrotron. This maser comprises a pair of spaced mirrors defining a quasi-optical cavity there between, with one mirror being provided with an orifice to permit extraction of the x-ray beam produced. A Bragg reflector is connected to the mirror orifice to reduce the microwave power loss from the device through the orifice. Electrons injected in the maser cavity are caused to 'wiggle' by the interacting microwave field, which functions as an undulator, so as to produce a non-coherent x-ray beam that travels along the longitudinal axis of the cavity and exits through the mirror orifice.

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MANUFACTURING & INDUSTRIAL ENGINEERING: Other

0495 Ceramic Heat Pipe Wick
B. Seidenberg, T. Swanson
National Aeronautics and Space Administration, Greenbelt, MD. Goddard Space Flight Center
Filed 31 Jan 89 18p
PAT-APPL-7-304 147 Available from NTIS: price code N03
A wick for use in a capillary loop pump heat pipe is disclosed. The wick material is an essentially uniformly porous, permeable, open-cell, silicon dioxide/aluminum oxide inorganic ceramic foam having a silica fiber ratio, by weight, of about 78 to 22, respectively, a density of 6 lbs/cu ft, and an average pore size of less than 5 microns. A representative material having these characteristics is Lockheed Missile and Space Company, Inc.'s HTP 6-22. This material is fully compatible with the freons and anhydrous ammonia and allows for the use of these very efficient working fluids, and others, in capillary loops.

0496 Continuously Variable Gear Drive Transmission
V. Y. Won
Department of the Air Force, Washington, DC
Filed 20 May 87, patented 8 Aug 89 14p
PATENT-4 854 190 Available from Comm. of Patents
The invention comprises an all gear transmission mechanism capable of producing a wide range of speed outputs, including very high torque at low speed and very high speed at low torque. This result is provided by a combination of epicyclic gearing and differential gearing. The invention also includes an all gear feedback mechanism for sustaining desired operating speeds and torques as well as for performing rapid changes in gear ratio that produce rapid acceleration and deceleration of output shaft rotation. The invention comprises an all gear mechanism for a continuously variable transmission that provides a wide range of output speeds and torques. The Basic element of the transmission is a floating gear assembly can either comprise a floating gearbox or a floating gear arrangement incorporated into a differential assembly with idler gears. Various controlling mechanisms are shown and described which include first and second mechanical feedback loops. With these speed control systems, the output gear ratio can be made to change either linearly to geometrically to produce a desired output speed and torque. Patents.

0497 Convergent Strand Array Liquid Pumping System
E. R. Collins
National Aeronautics and Space Administration, Pasadena, CA. Pasadena Office
Filed 13 Apr 89, patented 31 Oct 89 9p
PATENT-4 877 082 Available from Comm. of Patents
A surface-tension liquid pumping system is provided by one or more arrays of converging solid monofilament fibers or metal wires (strands) spaced apart at an input end to gather liquid, and gathered close together at the opposite end where menisci forms between wetted strands to force liquid in the direction of convergence of the strands. The liquid pumping system is independent of gravity. It is illustrated as being used in a heat pump having a heating box to vaporize the liquid and a condensing chamber. Condensed liquid is returned by the pumping system to the heating box where it is again vaporized. A vapor tube carries the vapor to the condensing chamber. In that way, a closed system pumps heat from the heating box to the evaporating chamber and from there radiated to the atmosphere.

0498 Distributed Proximity Sensor System
S. Lee
National Aeronautics and Space Administration, Pasadena, CA. Pasadena Office
Filed 30 Dec 88 22p
PAT-APPL-7-292 047 Available from NTIS: price code A03
The invention relates to sensors embedded on the surface of a robot hand, or other moving member. By distributing proximity sensors capable of detecting distances and angles to points on the surface of an object, information is obtained for achieving noncontacting shape and distance perception, i.e., for automatic determination of the object's shape, direction, and distance, as well as the orientation of the object relative to the robot hand or other moving member.

Electrostatic Dissipative Maintenance Aid Module Container
See 0219

Expanding Ring Joint
See 0485

Explosion Suppression System
See 0828

Gripping Device
See 0458

Heat Engine Based on Shape Memory Alloys
See 0397

0499 High Temperature Electric Arc Furnace and Method
R. M. Poorman, D. D. Schmidt
National Aeronautics and Space Administration, Huntsville, AL. George C. Marshall Space Flight Center
Filed 13 Jun 88, patented 20 Feb 90 6p
PATENT-4 902 354 Available from Comm. of Patents
An apparatus and process for improving the microstructure of electrically conducting materials is disclosed by the present invention. A revolving heat source applies heat to the surface of the material evenly and quickly. One or more heat sinks quickly cool the material. In the preferred embodiment, the cooling may be done in such a way as to promote as high a degree of directional grain growth as desired or completely nondirectional grain growth.

0500 Light collection device for flame emission detectors
S. D. Woodruff, R. G. Logan, R. L. Pineault
Department of Energy, Morgantown, WV. Morgantown Energy Technology Center
Filed 14 Apr 89 13p
PAT-APPL-7-337 979 Available from NTIS: price code A03
This report describes a light collection device for use in a flame emission detection system such as an on-line, real-time alkali concentration process stream monitor. The device comprises a sphere coated on its interior with a highly diffuse reflective paint which is positioned over a flame emission source and one or more fiber optic cables which transfer the light generated at the interior of the sphere to a detecting device. The diffuse scattering of the light emitted by the flame uniformly distributes the light in the sphere, and the collection efficiency of the device is

greater than that obtainable in the prior art. The device of the present invention thus provides enhanced sensitivity and reduces the noise associated with flame emission detectors, and can achieve substantial improvements in alkali detection levels. 2 figs.

0501 Low-Noise Nozzle Valve
H. S. Gwin, J. Aaron
National Aeronautics and Space Administration, Huntsville, AL. George C. Marshall Space Flight Center
Filed 7 Sep 89 15p
PAT-APPL-7-404 290 Available from NTIS: price code N03
A low noise, variable discharage area, valve is constructed having opposed recesses within which a pair of gates are slidably disposed. Each of the gates is provided with upstream edges having a radius thereon, the radius enabling smooth, accelerated, low noise flow therebetween. The gates are further provided with tracks along each side, which in turn slide along splines set in the side walls of the valve. A threaded rod which rotates in a threaded insert in a rear wall of each of the gates, serves to move the gates within their respective recesses.

Mechanism for Proportionately Loading Dual Thrust Bearing Assemblies against Axial Thrust Loads
See 0463

0502 Method and Apparatus for Positioning a Robotic End Effector
C. Hess, L. C. H. Li
National Aeronautics and Space Administration, Houston, TX. Lyndon B. Johnson Space Center
Filed 10 Aug 89 24p
PAT-APPL-7-392 235 Available from NTIS: price code N03
A robotic end effector and operation protocol for a reliable grasp of a target object irrespective of the target's contours is disclosed. A robotic hand includes a plurality of jointed fingers, one of which, like a thumb, is in opposed relation to the other. Each finger is comprised of at least two jointed sections, and provided with reflective proximity sensors, one on the inner surface of each finger section. Each proximity sensor comprises a transmitter of a beam of radiant energy and means for receiving reflections of the transmitted energy when reflected by a target object and for generating electrical signals responsive thereto. On the fingers opposed to the thumb, the proximity sensors on the outermost finger sections are aligned in an outer sensor array and the sensors on the intermediate finger sections and sensors on the innermost finger sections are similarly arranged to form an intermediate sensor array and an inner sensor array, respectively. The invention includes a computer system with software and/or circuitry for a protocol comprising the steps in sequence of: (1) approach axis alignment to maximize the number of outer layer sensors which detect the target; (2) non-contact contour following the target by the robot fingers to minimize target escape potential; and (3) closing to rigidize the target including dynamically re-adjusting the end effector finger alignment to compensate for target motion. A signal conditioning circuit and gain adjustment means are included to maintain the dynamic range of low power reflection signals.

Methods of and system for swing damping movement of suspended objects
See 0914

0503 Multiple forearm robotic elbow configuration background of the invention
J. J. Fisher
Du Pont de Nemours (E.I.) and Co., Aiken, SC.; Department of Energy, Washington, DC
Filed 8 Jun 89 vp.p
PAT-APPL-7-363 031 Available from NTIS: price code A03
A dual forearmed robotic elbow configuration comprises a main arm having a double elbow from which two coplanar forearms depend, two actuators carried in the double elbow for moving the forearms, and separate, independent end effectors, operated by a cable carried from the main arm through the elbow, is attached to the distal end of each forearm. Coiling the cables around the actuators prevents bending or kinking when the forearms are rotated 360 degrees. The end effectors can have similar or different capabilities. Actuator canisters within the dual elbow are modular for rapid replacement or maintenance. Coarse and fine resolver transducers within the actuators provide accurate position referencing information. 3 figs.

0504 Piston Sealing Arrangement for a Cryogenic Refrigerator
G. F. Green, J. C. Humphrey
Department of the Navy, Washington, DC
Filed 1 Jun 83, patented 21 Feb 84 3p
PATENT-4 432 556 Available from Comm. of Patents
A sealing arrangement for a rectilinear reciprocable piston within a cryogenic refrigerator comprises a buffer defined by dual O-rings diposed around the circumference of the piston and containing pressurized gas of the same type as the refrigeration gas. The buffer limits or prevents both the entrance of contaminants and also the escape of the refrigeration gas. Patents.

Pressure Sensitive Release Device
See 0472

0505 Pressurized Bellows Flat Contact Heat Exchanger Interface
F. E. Voss, H. R. Howell, R. V. Winkler
National Aeronautics and Space Administration, Houston, TX. Lyndon B. Johnson Space Center
Filed 30 Sep 88, patented 20 Mar 90 7p
PATENT-4 909 313 Available from Comm. of Patents
Disclosed is an interdigitated plate-type heat exchanger interface. The interface includes a modular interconnect to thermally connect a pair or pairs of plate-type heat exchangers to a second single or multiple plate-type heat exchanger. The modular interconnect comprises a series of parallel, plate-type heat exchangers arranged in pairs to form a slot therebetween. The plate-type heat exchangers of the second heat exchanger insert into the slots of the modular interconnect. Bellows are provided between the pairs of fins of the modular interconnect so that when the bellows are pressurized, they drive the plate-type heat exchangers of the modular interconnect toward one another, thus closing upon the second heat exchanger plates. Each end of the bellows has a part thereof a thin, membrane diaphragm which readily conforms to the contours of the heat exchanger plates of the modular interconnect when the bellows is pressurized. This ensures an even distribution of pressure on the heat exchangers of the modular interconnect thus creating substantially planar contact between the two heat exchangers. The effect of the interface of the present invention is to provide a dry connection between

two heat exchangers whereby the rate of heat transfer can be varied by varying the pressure within the bellows.

0506 Programmable Near-Infrared Ranging System
H. R. Everett
Department of the Navy, Washington, DC
Filed 26 Feb 88, patented 25 Jul 89 11p
PATENT-4 851 661 Available from Comm. of Patents
A high angular resolution ranging system particularly suitable for indoor applications involving mobile robot navigation and collision avoidance uses a programmable array of light emitters that can be sequentially incremented by the microprocessor. A plurality of adjustable level threshold detectors are used in an optical receiver for detecting the threshold level of the light echoes produced when light emitted from one or more of the emitters is reflected by a target or object in the scan path of the ranging system. Patents.

0507 Quick Disconnect Duct Coupler
D. D. Dierksmeier
Department of the Air Force, Washington, DC
Filed 24 Sep 87, patented 13 Jun 89 4p
PATENT-4 838 584 Available from Comm. of Patents
A coupling device utilizing first and second contiguous L-shaped coupling members affixed to terminal duct portions, and a slidable clamp having a T-shaped trough for gripping the L-shaped coupling members when slid thereover, locking them together to the close the duct. The clamp is slid away from coupling members to rapidly open the duct. Patent.

0508 Reusable High-Temperature Heat Pipes and Heat Pipe Panels
C. J. Camarda, P. O. Ransone
National Aeronautics and Space Administration, Hampton, VA. Langley Research Center
Filed 29 Aug 88, patented 13 Jun 89 7p
PATENT-4 838 346 Available from Comm. of Patents
A reusable, durable heat pipe which is capable of operating at temperatures up to about 3000 F in an oxidizing environment and at temperatures above 3000 F in an inert or vacuum environment is produced by embedding a refractory metal pipe within a carbon-carbon composite structure. A reusable, durable heat pipe panel is made from an array of refractory-metal pipes spaced from each other. The reusable, durable, heat-pipe is employed to fabricate a hypersonic vehicle leading edge and nose cap.

0509 Robust High-Performance Control for Robotic Manipulators
H. Seraji
National Aeronautics and Space Administration, Pasadena, CA. Pasadena Office
Filed 17 May 89 60p
PAT-APPL-7-353 411 Available from NTIS: price code A04
Model-based and performance-based control techniques are combined for an electrical robotic control system. Thus, two distinct and separate design philosophies were merged into a single control system having a control law formulation including two distinct and separate components, each of which yields a respective signal component that is combined into a total command signal for the system. Those two separate system components include a feedforward controller and feedback controller. The feedforward controller is model-based and contains any known part of the manipulator dynamics that can be used for on-line control to produce a nominal feedforward component of the system's control signal. The feedback controller is performance-based and consists of a simple adaptive PID controller which generates an adaptive control signal to complement the nomical feedforward signal.

0510 Structural Vibration and Shock Isolation in a High Pressure Environment
R. E. Waclawik
Department of the Navy, Washington, DC
Filed 1 Jun 89 8p
PAT-APPL-7-359 895 Available from NTIS: price code N03
At the output end of a piping system, components subject to vibration and shock are isolated from components at the input end of the system. The isolation is achieved by a clamping arrangement in which a plurality of deformable isolation material components are inserted between the two ends. The system operates under a high fluid pressure and is arranged to enable the high pressure to act upon the isolation material to assist in forming a seal within the flow path. Keywords: Vibration isolators; Piping systems. Patent applications.

0511 Surface Tension Confined Liquid Cryogen Cooler
S. H. Castles, M. E. Schein
National Aeronautics and Space Administration, Greenbelt, MD. Goddard Space Flight Center
Filed 13 Jun 88, patented 18 Apr 89 6p
PATENT-4 821 907 Available from Comm. of Patents
A cryogenic cooler is provided for use in craft such as launch, orbital, and space vehicles subject to substantial vibration, changes in orientation, and weightlessness. The cooler contains a small pore, large free volume, low density material to restrain a cryogen through surface tension effects during launch and zero-g operations and maintains instrumentation within the temperature range of 10 to 140 K. The cooler operation is completely passive, with no inherent vibration or power requirements.

Three-Dimensional Laser Velocimeter Simultaneity Detector
See 0926

0512 Two Stage Sorption Type Cryogenic Refrigerator Including Heat Regeneration System
J. A. Jones, L. Wen, S. Bard
National Aeronautics and Space Administration, Pasadena, CA. Pasadena Office
Filed 31 Jan 89 27p
PAT-APPL-7-304 149 Available from NTIS: price code A03
A lower stage chemisorption refrigeration system physically and functionally coupled to an upper stage physical adsorption refrigeration system is disclosed. Waste heat generated by the lower stage cycle is regenerated to fuel the upper stage cycle thereby greatly improving the energy efficiency of a two-stage sorption refrigerator. The two stages are joined by disposing a first pressurization chamber providing a high pressure flow of a first refrigerant for the lower stage refrigeration cycle within a second pressurization chamber providing a high pressure flow of a second refrigerant for the upper stage refrigeration cycle. The first pressurization chamber is separated from the second pressurization chamber by a gas-gap thermal switch which at times is filled with a thermoconductive fluid to allow conduction of heat from the first pressurization chamber to the second pressurization chamber.

MARINE TECHNOLOGY

0513 Apparatus for Deploying and Recovering a Seaborne Vessel
J. M. Walton, A. E. Munson
Department of the Navy, Washington, DC
Filed 11 Jan 88, patented 31 Oct 89 9p
PATENT-4 876 979 Available from Comm. of Patents
An apparatus for employing and retrieving a seaborne vehicle having a frangible surface includes a muzzle and a cylindrically shaped cocoon. The muzzle is clamped to the vehicle and then pulled by a rope into the cocoon. Bladders within the cocoon are inflated with pressurized air to retain the vehicle. The vehicle can then be safely retrieved by hoisting the cocoon out of the ocean. Vehicle deployment is achieved by placing the vehicle in the cocoon, pressurizing the bladders with air, lowering the cocoon and attendant vehicle into the ocean, exhausting the air from the bladders, and then towing the cocoon so that water passing through apertures in the bow of the cocoon push the vehicle into the open ocean. Patents.

0514 At-Sea Recovery Handling System
R. D. Cavanagh, P. E. Nelson
Department of the Navy, Washington, DC
Filed 6 Oct 88, patented 26 Sep 89 4p
PATENT-4 869 149 Available from Comm. of Patents
This patent discloses a stabilizing system for use in conjunction with a crane/boom in which an object is held fast to a foam cushion within the system. A hook that forms part of the system grasps a sling holding the object and secures the object against the foam cushion. The object can be aligned by being rotated or tilted while held fast to the cushion. The object is prevented from swinging and swaying, thereby greatly reducing danger. Torpedo recovery, Patents.

0515 Barge Connector System
M. E. Capron
Department of the Navy, Washington, DC
Filed 29 Dec 89 21p
PAT-APPL-7-459 180 Available from NTIS: price code N03
A barge connecting system for connecting a first vessel to a second vessel comprising three spaced parallel rectangular shaped plates, the first plate of which is attached to the stern of a lead vessel, and the third plate of which abuts or may be attached to the bow of a following vessel. Bracing for the second and third plates is provided by plurality of diagonal wire cables each of which has one end connected to a corner of the first rectangular shaped plate and the opposite end connected to either a corner of the second rectangular shaped plate or a corner of the third rectangular shaped plate. Positioned vertically between the first and second plates are a first pair of pneumatic fenders which are rotably mounted on the first plate by wire cables. There is positioned horizontally between the second and third plates a second pair of pneumatic fenders which are mounted on third plate by wire cables. The fenders allow horizontal movement of the second and third plates with respect to the first plate and vertical movement of third plate with respect to the first and second plates. Patent applications.

0516 Barge Connector System
M. E. Capron
Department of the Navy, Washington, DC
Filed 29 Dec 89, patented 3 Jul 90 9p
PATENT-4 938 163 Available from Comm. of Patents
This patent discloses a barge connecting system for connecting a first vessel to a second vessel comprising three spaced parallel rectangular shaped plates, the first plate of which is attached to the stern of a lead vessel, and the third plate of which abuts or may be attached to the bow of a following vessel. Bracing for the second and third plates is provided by plurality of diagonal wire cables each of which has one end connected to a corner of the first rectangular shaped plate and the opposite end connected to either a corner of the second rectangular shaped plate or a corner of the third rectangular shaped plate. Positioned vertically between the first and second plates are a first pair of pneumatic fenders which are rotatably mounted on the first plate by wire cables. There is positioned horizontally between the second and third plates a second pair of pneumatic fenders which are mounted on third plate by wire cables. The fenders allow horizontal movement of the second and third plates with respect to the first plate and vertical movement of third plate with respect to the first and second plates. Since the fenders are pneumatic, a surge force generated by the following vessel will be absorbed, the fenders will then expand and the following vessel will return to an equilibrium position with respect to the lead vessel. At least a pair of tow lines are used to connect to stern of the lead vessel to the bow of the following vessel when said third rectangular shaped plate is not attached to the bow of said following vessel. Patents.

0517 Closed Cycle Vaporization Cooling System for Underwater Vehicle Inner-to-Outer Hull Heat Transfer
R. D. Rogalski, G. F. Wilhelmi
Department of the Navy, Washington, DC
Filed 24 Aug 82, patented 2 Oct 84 14p
PATENT-4 474 228 Available from Comm. of Patents
This patent discloses a closed cycle vaporization cooling system for an underwater vehicle's inner-to-outer hull heat transfer having low pressure freshwater circulating loop means for collecting and cooling waste heat from inside the vessel and so configured to operate under all conditions, an adiabatic zone within the loop for conveying vaporized working fluid to a condenser means located outside the underwater vehicle's pressure hull utilizing a chimney effect free-flooded seawater heat sink wherein cold seawater flows from bottom to top of the heat sink over the condenser means, and a condensate means for condensing and returning the condensate to the evaporator means.

0518 Detachable Storage Tank for Hydrofoils
J. R. Meyer
Department of the Navy, Washington, DC
Filed 28 May 82, patented 22 May 84 6p
PATENT-4 449 472 Available from Comm. of Patents
An easily detachable storage tank for use with existing hydrofoil ships is connected to the ship by two struts with minimal modifications to the ship. The shipboard connections are such that the ship is also usable without the storage tank. The tank may store fuel in a plurality of cells having a diaphragm separating the fuel from ballast seawater. Weapons may also be stored in the tank and fired directly from the tank. Keywords: Patents.

0519 Inflatable Boat with Demountable Transom
W. W. McCrory, W. B. Quigley, W. A. Garnett
Department of the Navy, Washington, DC
Filed 29 Oct 82, patented 22 May 84 5p
PATENT-4 449 473 Available from Comm. of Patents
This invention relates to high speed inflatable boats and more particularly to an improved transom construction therefor. It is a principal object of this invention to provide, in combination with an inflatable boat having inflatable side sponsons and a rigid fore and aft keelson, a demountable transom that is removably attached to the side sponsons and keelson and can itself be folded, to the end that the boat can be furled into a smaller package than heretofore, and yet provides the necessary rigidity of support for the sponsors and an outboard motor. Another important object of the invention is the provision of an improved transom construction for inflatable boats, that offers the additional advantage of lightness in weight compared to the prior all-wood transom, together with greater durability and a reliability under conditions of hard usage. Still another object of the invention is to accomplish the foregoing through a novel combination of elements and arrangement of parts that offer ease and simplicity in assembly, maintenance and repair, as well as convenience and interchangeability between boats. Keywords: Patents, Outboard motors, Mounts.

0520 Low Force Cable Disconnect
P. Moody
Department of the Navy, Washington, DC
Filed 24 May 90 10p
PAT-APPL-7-527 978 Available from NTIS: price code N03
An underwater receptacle has a pressure balancing arrangement that balances the underwater force that tend to hold a receptacle and its mated plug together. The pressure balancing arrangement also relieves the air pressure formed between the insert discs of the plug and receptacle when connecting the insert discs respective electrical pins and sockets. This is achieved by moving the volume of air formed between the discs on connecting the respective components. The volume of air passes through the receptacle disc and operates a piston to form a chamber for holding the volume of air. The other side of the piston is exposed to sea pressure. This forces the volume of air back into its original position and eliminates a vacuum suction by neutralizing the pressure on the plug when disconnecting the plug from the receptacle. Patent application.

0521 Man Portable Shallow Water Structure
M. A. Paige
Department of the Navy, Washington, DC
Filed 29 Apr 87, patented 9 Jan 90 11p
PATENT-4 892 445 Available from Comm. of Patents
A man portable (80 lbs) surface piercing structure which can be installed in shallow water (nominally 10 ft) from a small boat without divers assistance. The structure is comprised of two separate assemblies, a mast and a foundation. The mast is joined to its foundation by a mechanical latch and release mechanism which is internal to the mast. This invention relates to support structure and more particularly to method and apparatus for installing support structures for tide measurement and telemetry system, in shallow coastal waters. Keywords: Patents.

0522 Noise-Suppressing Hydrophones
M. Kahn
Department of the Navy, Washington, DC
Filed 30 Jun 89 16p
PAT-APPL-7-373 979 Available from NTIS: price code N03
A hydrophone mounted on the hull of a ship comprises an electromechanical transducer made of void-containing ceramic material having a high piezoelectric sensitivity to water-borne acoustic sound signals, a transducer made of solid ceramic material having a low piezoelectric sensitivity to hydrostatic acoustic signals, both transducers, having similar piezoelectric sensitivity to shipboard noise transmitted via the ship's hull and transducer mounting; and means for sensing and manipulating voltage signals generated in response to water-borne acoustic signals and mount-transmitted shipboard noise such that the mount transmitted noise signals are largely cancelled out and a relatively noise-free signal representing hydrostatically transmitted sound is obtained. Keywords: Piezoelectric transducers; Ship noise cancellation. Patent applications.

0523 Paravane with Automatic Depth Control
D. M. Pickett, R. K. Knutson, W. VonFeldt
Department of the Navy, Washington, DC
Filed 28 Feb 80, patented 7 Aug 84 9p
PATENT-4 463 701 Available from Comm. of Patents
A paravane includes an elongated fuselage; a wing section of spaced wing members attached to an intermediate portion of the fuselage; stabilizer fins for maintaining the paravane lined-up with the direction of tow; a depth control flap positioned adjacent the wing section and having a pivot axis extending closely adjacent to the towing point; and depth control means of controlling the position of the control flap. The wing members have a straight leading edge portion, a straight trailing edge portion and a curved intermediate portion wherein the wing members are arranged such that the chord lines extend at oblique angles with the longitudinal axis of the fuselage and such that the resultant hydrodynamic lift force vector acting on the wing section passes through the tow point. Keywords: Patents, PAT-CL-114-245.

0524 Portable Rapid Installable Dolphin System
S. S. Lin
Department of the Navy, Washington, DC
Filed 1 May 89 17p
PAT-APPL-7-345 339 Available from NTIS: price code N03
This invention relates generally to moorings for ocean going vessels. In particular, this invention relates to a portable dolphin system which is rapidly installable and retrievable for reuse. In the prior art there are several marine structures which are designed to resist ship berthing loads. Driven pile clusters usually made of wood, concrete or steel are used to protect piers, docks and wharfs. The number of piles in a cluster ranges from 3 to 19. The driven pile cluster is suitable for soils such as dense sand or hard clays but is not suitable on soft sediments. To resist large ship loads such as those resulting from oil tankers, cellular sheet pile walls filled with granular materials have been used. On mud or a soft clay sea floor, the piles must be driven to great depths to insure proper lateral resistance. In addition, the sheet pile wall cannot be driven into hard coral or rock. A third type of dolphin is a closed box concrete caisson which is pre-fabricated, towed to a designated site and ballasted with sea water. For a permanent installation,

a layer of gravel or crushed rock is placed on the sea floor prior to placement of the caisson. However, the concrete box caisson is very heavy and bulky. Keywords: Patent applications.

0525 Portable, Rapid Installable Dolphin System
S. S. Lin
Department of the Navy, Washington, DC
Filed 1 May 89, patented 28 Nov 89 9p
PATENT-4 883 013 Available from Comm. of Patents
This patent discloses a portable rapidly installable dolphin system comprising a gravity base with a skirt which may be ballasted or deballasted at a site of interest. A pair of fenders are mounted vertically on a rectangular shaped plate which has a pair of legs connected in rotational engagement to the gravity base. The fenders function to transmit a moored vessel's load to the gravity base. Activating an air operated cylinder mounted within the gravity base will effectuate the movement of the plate's support structure so as to cause the plate to rise from a first position which is parallel to and above the gravity base to a second position which is perpendicular to and above the gravity base. Six propellant embedment anchors hold the dolphin in place. Keywords: Patents; Dolphins structures; Portable equipment; Ship moorings.

0526 Retractable, Lever Action, Scroll Seal for a Surface Effect Ship
F. W. Wilson, T. D. Smith
Department of the Navy, Washington, DC
Filed 24 Feb 86, patented 29 Sep 87 7p
PATENT-4 696 362 Available from Comm. of Patents
This abstract discloses an improved seal design for a Surface Effect Ship, having an inflatable inner seal member, and outer seal member composed of a pliable sheet material scrollably affixed to the hull fore and aft of the inner seal member. The seal may be retracted for hullborne operation by deflating the inner seal member and scrolling the outer seal member tight to hull. The inner seal member has transverse webbing for stability. The outer seal member is periodically scrolled forward to expose an unworn section to the water surface thereby reducing seal failure due to wear. The present invention relates generally to an Air Cushion Vehicle. An Air Cushion Vehicle (ACV) rides on a cushion of air contained below the ship by a flexible seal depending from the ship's periphery. A Surface Effect Ship (SES), an ACV comprising two sidehulls, a fore seal, and an aft seal, may operate in either the hullborne mode or the air cushion. Objects of the present invention are to reduce the wear and drag of an SES seal; to improve the safety of air cushion operation; to reduce the risk of damage and injury from seal failure due to excessive cushion venting, seal deflation, seal sweepback, and seal damage from wear; to improve the hullborne operating characteristics of an SES; and to reduce the frequency, expense, and difficulty of SES seal maintenance. Patents.

0527 Shallow Water Environmental/Oceanographic Measurement System
A. L. Sutherland, R. C. Swenson
Department of the Navy, Washington, DC
Filed 31 Aug 81, patented 15 May 84 5p
PATENT-4 448 068 Available from Comm. of Patents
A shallow water environmental/oceanographic measurement system for real time monitoring of specific parameters at a particular location is disclosed. A three point moored buoy is anchored over the particular location. Bottom mounted sensors to measure the specific parameters are situated generally within the area of the three point mooring area. Sensor data is transmitted via cable to the buoy from where it is telemetered to a shore station. Salt mounds located along the Gulf of Mexico in the states of Texas and Louisiana, if evacuated of their brine contents, could form extensive natural storage cavities. The brine content would be pumped out of these mounds and deposited via pipeline and diffuser into the Gulf of Mexico. It is desired to assess the total ecosystem impact on the receiving waters and biota from the discharge of these saturated brine solutions. Keywords: Patents.

0528 Stabilized Suspension for Immersible Apparatus
M. E. Snyderwine
Department of the Navy, Washington, DC
Filed 19 Oct 87, patented 1 Aug 89 6p
PATENT-4 853 900 Available from Comm. of Patents
Motion of an instrument suspension cable assembly is attenuated in a liquid having flow fields and surface swells. Strumming which causes vibratory motion is precluded by enclosing the cable assembly along the axis of suspension to isolate it from the flow fields. Motion along the axis of suspension due to the surface swells is substantially reduced by incorporating drag therealong on the cable assembly enclosure. Patents.

Underwater Mateable Electrical Connector
See 0248

Underwater Object Detection System
See 0186

0529 Vibration and Shock Resistant Heat Exchanger
W. G. Patton, V. H. Dilling, G. F. Green
Department of the Navy, Washington, DC
Filed 30 May 85, patented 19 Jan 88 8p
PATENT-4 719 969 Available from Comm. of Patents
The present invention relates generally to an improved finned tube heat exchanger, and more specifically to a finned tube support member and a radial bumper support means for reducing heat exchanger damage, efficiency loss, and failure due to vibration and shock loading. In recent years there has been substantial interest in developing superconductive propulsion systems for marine vehicles. Modern marine vehicles have critical component restrictions. Size, weight and complexity are important considerations. A superconducting propulsion system is highly desirable because it is compact and light weight as compared to a comparable, traditional motor-generator system. Superconducting propulsion systems incorporate helium liquefiers which operate at cryogenic temperatures and require a high efficiency heat exchanger. The magnet is a superconducting system must be cooled to an operating temperature approaching 0 degrees Kelvin. The system as a whole operates in normal room temperature. The helium liquefier therefore requires a heat exchanger which is highly efficient throughout a range from about 300 degrees Kelvin to about 4 degrees Kelvin. Patents.

MATERIALS: Adhesives & Sealants

Acetylene Terminated Aromatic Amide Monomers
See 0062

Copolyimide with a Combination of Flexibilizing Groups
See 0071

0530 High Temperature Flexible Seal
B. M. Steinetz, P. J. Sirocky
National Aeronautics and Space Administration, Cleveland, OH. Lewis Research Center
Filed 30 Dec 88 14p
PAT-APPL-7-292 146 Available from NTIS: price code A03
This device is concerned with sealing the sliding interfaces between structural panels that are roughly perpendicular to each other or whose edges are butted against one another. The gap which the seal element must seal in not uniform along the seal length requiring significant seal flexibility. The seal is mounted in a rectangular groove in a moveable structural panel. The seal comprises a plurality of rectangular shaped wafers stacked next to one another and preloaded in the axial direction to minimize leakage between wafers. The wafers are laterally preloaded to maintain sealing contact along the wafer faces which engage the adjacent wall of a sidewall using one of several approaches, such as the pressurized linear bellows. The seal accommodates distortions in the adjacent panel by relative sliding between adjacent wafers. Leakage between wafers is further minimized with good wafer surface finishes. Leakage between the seal nose and the adjacent structural panel is minimized when sealing against a distorted sidewall with relatively thin wafers and suitable seal preload apparatus. Leakage behind the seal is minimized with good groove tolerances and good sealing contact between the preload system and the back of the peripheral edge of the wafers.

High Temperature Flexible Seal
See 0281

0531 High Temperature, Flexible, Thermal Barrier Seal
P. J. Siroccky, B. M. Steinetz
National Aeronautics and Space Administration, Cleveland, OH. Lewis Research Center
Filed 27 Nov 89 13p
PAT-APPL-7-441 672 Available from NTIS: price code N03
This device seals the sliding interfaces between structural panels that are roughly perpendicular to each other or whose edges are butted against one another. The nonuniformity of the gap between the panels requires significant flexibility along the seal length. The seal is mounted in a rectangular groove in a moveable structural panel. A plurality of particles or balls is densely packed in an outer sheathing. The balls are laterally preloaded to maintain sealing contact with the adjacent wall using a pressurized linear bellows. Distortions in the adjacent panel are accommodated by rearrangement of the particles within the outer sheathing. Leakage through the seal is minimized by densely compacting the internal particles and by maintaining positive preload along the back side of the seal. The braid architecture of the outer sheathing is selected to minimize leakage through the seal and to resist mechanical abrasion.

0532 Method for Maintaining Precise Suction Strip Porosities
F. H. Gallimore
National Aeronautics and Space Administration, Hampton, VA. Langley Research Center
Filed 22 Jul 88, patented 25 Jul 89 10p
PATENT-4 851 071 Available from Comm. of Patents
This invention relates to a masking method generally and, more particularly to a method of masking perforated titanium sheets having laminar control suction strips. As illustrated in the drawings, a nonaerodynamic surface of a perforated sheet has alternating suction strip areas and bonding land areas. Suction strip tapes overlie the bonding land areas during application of a masking material to an upper surface of the suction strip tapes. Prior to bonding the perforated sheet to a composite structure, the bonding land tapes are removed. The entire opposite aerodynamic surface is masked with tape before bonding. This invention provides a precise control of suction strip porosities by ensuring that no chemicals penetrate the suction strip areas during bonding.

0533 Method of Effecting Expanding Chemical Anchor/Seals for Rock Cavities
D. Swanson, M. Schlump
Department of the Interior, Washington, DC
Filed 20 Jun 89 18p
PAT-APPL-7-383 111 Available from NTIS: price code A03
Method of sealing a cavity formed in a rock against the passage of fluids without fracturing the rock by placing wadding in the cavity and adding a supply of expanding chemical grout to effect a seal upon hardening has been developed.

MATERIALS: Coatings

0534 Arc-Textured High Emittance Radiator Surfaces
B. A. Banks
National Aeronautics and Space Administration, Cleveland, OH. Lewis Research Center
Filed 18 Jul 89 11p
PAT-APPL-7-381 240 Available from NTIS: price code A03
High emittance radiator surfaces are produced by arc-texturing. This process produces such a surface on a metal by scanning it with a low voltage electric arc from a carbon electrode in an inert environment.

0535 Cast-On Surfacing of Evaporative Pattern Castings
J. Hansen
Department of the Interior, Washington, DC
Filed 2 Oct 89 30p
PAT-APPL-7-415 837 Available from NTIS: price code N03
The present invention is a method of bonding a powdered protective metal surface layer to a portion of the surface of a cast object to protect the surface of the cast object. Initially, an evaporative casting pattern of the object to be cast is prepared. A layer of the powdered metal is then applied to the surface portion of the pattern corresponding to the casting surface to be protected. The layered pattern is next placed in a flask and surrounded with sand to create a mold cavity. The flask is then evacuated to help maintain the mold cavity, to assist in infiltration, and to remove gases arising during casting. Finally, the molten metal is poured into the mold cavity so that the molten metal vaporizes the pattern and fuses to the powdered protective metal.

0536 Coating and Composition Containing Lipid Microstructure Toxin Dispensers
R. R. Price, R. Brady
Department of the Navy, Washington, DC
Filed 14 Apr 89 22p
PAT-APPL-7-343 762 Available from NTIS: price code N03
A coating composition contains an effective amount of between 5 and 70 percent by weight of metalized tubules which are or which encapsulate a composition known to have an antifouling effect or known to possess antimicrobial, herbicidal algaicidal or pesticidal (biocidal) properties. When the coating composition is applied to a surface to be protected, a toxic surface environment is formed. The tubules can be used alone or the tubules can contain in the hollow core a secondary or co-biocidal agent or mixtures of these agents. When desired, the metal coating layer metalizing the tubule can be a non-biocidal metal. In those cases, protection is provided by the biocidal agent carried in the core. Keywords: Antifouling coatings; Biofouling, Patent applications.

0537 Combination Primer/Topcoat Coating
C. R. Hegedus, W. J. Green
Department of the Navy, Washington, DC
Filed 28 Mar 89, patented 5 Dec 89 4p
PATENT-4 885 324 Available from Comm. of Patents
A coating for metallic or polymeric composite substrates is disclosed which performs both as a primer and as a topcoat. It comprises a two component aliphatic polyurethane binder, with titanium dioxide, zinc molybdate, zinc phosphate, an organo-zinc salt, and titanium dioxide vesiculated bead pigments in controlled amounts. The coating exhibits good adhesion, corrosion inhibition, flexibility, chemical and weather resistance, and opacity. Patents.

Corrosion-Inhibiting Coating Composition
See 0595

Corrosion Resistant Metallic Glass Coatings Background of the Invention
See 0596

Crossdyeable Cotton Fabrics with Removable Wrap Size
See 0563

0538 Energy Beam Treatment for Improved Adhesion of Coatings to Surfaces
I. L. Singer
Department of the Navy, Washington, DC
Filed 31 Oct 89 38p
PAT-APPL-7-429 959 Available from NTIS: price code N03
The present invention relates to engineering materials in general and more specifically to the coating of bulk engineering material with corrosion, oxidation or wear resistant inorganic materials. Coatings are needed for protecting engineering components against mechanical, tribological and corrosive/oxidative degradation. In particular, engineering ceramics, by virtue of their light weight, high strength and thermal stability, have great potential for many high temperature applications. However, several of the best and toughest candidate ceramics, e.g. Silicon Carbide, Silicon Nitride, and Tungsten Carbide, require oxide coatings to resist corrosion and oxidation at high temperatures (900 C and up). The coating of a substrate with a coating different from and non-reactive with the substrate is improved by energetic surface alloying of the substrate prior to coating. The ion implantation alters the stoichiometry of the substrate, creating a substrate surface which is reactive with the coating. For example, the bonding of TiN to Si3N4 is enhanced by implanting the substrate surface with Ti. Patent applications.

0539 High Gloss Corrosion-Resistant Coatings
C. R. Hegedus, D. J. Hirst, A. T. Eng, W. J. Green
Department of the Navy, Washington, DC
Filed 28 Nov 89 23p
PAT-APPL-7-442 085 Available from NTIS: price code N03
This patent application discloses a high-gloss, corrosion-resistant coating which can be applied directly to a surface comprising about 30 to 82 percent by weight of a polymeric binder and 18 to 70 percent by weight of a pigment system consisting essentially of zinc molybdate, zinc salt of benzoic acids, and zinc phosphate in specific ratios. The coating exhibits good adhesion, flexibility, chemical- and weather-resistance. Keywords: Corrosion resistant metal coatings; Polyurethane binders; Single top coat; Aircraft; Metal/Plastics substrates. Patent applications.

High-Temperature, Corrosion-Preventive Coating
See 0600

0540 Metal Film Coatings on Amorphous Metallic Alloys
L. Kabacoff
Department of the Navy, Washington, DC
Filed 11 Jul 89 15p
PAT-APPL-7-377 997 Available from NTIS: price code N03
Fe-metalloid amorphous metallic alloy ribbons, when properly annealed in a transverse magnetic field, exhibit extremely high magnetomechanical coupling. Other amorphous metallic alloys (or glassy metals) have desirable properties such as high strength, corrosion resistance, high magnetic permeabilities, etc. Coating of crystalline metals (Silver, Gold, Copper, Aluminum) are formed on amorphous metallic alloys (glassy metals) by cathode magnetron sputtering. The process can be used to produce new products such as copper coated amorphous metallic alloy wires for torpedo controls, shielding materials for electromagnetic waves, and anticorrosion coatings for Fe-metalloid magnetostrictive elements. Patent applications.

Method of Modifying the Dielectric Properties of an Organic Polymer Film
See 0080

0541 Method of Preparing a Thin Diamond Film
R. A. Neifeld
Department of the Army, Washington, DC
Filed 18 Dec 89 8p
PAT-APPL-7-451 699 Available from NTIS: price code N03
This patent application provides a method of making a diamond thin film that will be characterized by high thermal conductivity, large band gap, and high electron mobility, or the properties that are desired for electronic devices. A thin diamond film is prepared by immersing a substrate in a liquid containing carbon and hydrogen and then subjecting the substrate to at least one laser pulse. Keywords: Excimer laser pulses; Methanol pyrolysis.

Microporous Structure with Layered Interstitial Surface Treatment, and Method and Apparatus for Preparation Thereof
See 0113

0542 Nickel Oxide, Ceramic Insulated, High Temperature Coating
L. F. Aprigliano
Department of the Navy, Washington, DC
Filed 26 Nov 85, patented 27 Jan 87 4p
PATENT-4 639 399 Available from Comm. of Patents
A three layer composite coating for gas turbine engine materials and other materials exposed to high temperatures, thermal cycling, and corrosive environments. The base layer is Aluminide or an MCrAlY composite, where M is a metal selected from the group consisting of nickel or cobalt, alone or in combination. The middle layer is a ceramic composite. The outer layer is composed of nickel oxide. Patents.

Plastics Having Inert, Vapor-Impermeable, Diamond Like Carbon Coatings Thereon
See 0617

Polycarbonate Article with Chemical Resistant Coating
See 0559

0543 Process for Lowering the Dielectric Constant of Polyimides Using Diamic Acid Additives
D. M. Stoakley, A. K. St.Clair
National Aeronautics and Space Administration, Hampton, VA. Langley Research Center
Filed 1 Sep 88, patented 23 Jan 90 8p
PATENT-4 895 972 Available from Comm. of Patents
Linear aromatic polyimides with low dielectric constants are produced by adding a diamic acid additive to the polyamic acid resin formed by the condensation of an aromatic dianhydride with an aromatic diamine. The resulting modified polyimide is a better electrical insulator than state-of-the-art commercially available polyimides.

Sensitization Pretreatment of PB-Salt Epitaxial Films for Schottky Diodes by Sulfur Vapor Exposure
See 0296

Silver Coated Superconducting Ceramic Powder
See 0375

Silver-Nickel Composite Cathodes for Alkaline Secondary Batteries
See 0406

0544 Ultrasonic Assisted Paint Removal Method
T. J. Reinhart
Department of the Air Force, Washington, DC
Filed 7 Jul 87, patented 6 Jun 89 9p
PATENT-4 836 858 Available from Comm. of Patents
This abstract discloses paint or other protective coating removal method involving the use of reciprocal motion ultrasonic frequency mechanical energy applied to the coating by a variety of tool and abrasive substrate members in the company of surface preparation agents, such as coolant, heating, softening, and/or abrasive agents. The invention is particularly applicable and disclosed in terms of, protective coating removal from aircraft such as is often necessary for replacement or in the reutilization of aircraft with different identification markings. The coating removal method is environmentally and human operator safe in comparison with presently used coating removal methods such as abrasive blasting and chemical solvent removal. Keywords: Patents.

0545 UV absorption control of thin film growth
R. M. Biefeld, G. A. Hebner, K. P. Killeen, S. P. Zuhoski
Sandia National Labs., Albuquerque, NM.; Department of Energy, Washington, DC
Filed 27 Mar 89 14p
PAT-APPL-7-328 918 Available from NTIS: price code A03
A system for monitoring and controlling the rate of growth of thin films in an atmosphere of reactant gases measures the UV absorption of the atmosphere and calculates the partial pressure of the gases. The flow of reactant gases is controlled in response to the partial pressure.

MATERIALS: Composites

Acetylene Terminated Aromatic Amide Monomers
See 0062

Acetylene Terminated Aspartimides and Resins Therefrom
See 0063

0546 Advanced Composite Polar Boss
H. M. Reynolds, C. M. Kawabata
Department of the Air Force, Washington, DC
Filed 16 Oct 87, patented 1 Aug 89 10p
PATENT-4 852 347 Available from Comm. of Patents
Composite polar bosses applied in rocket motor cases have desirable characteristics. The lead time for a boss can be reduced from 6-12 months to 4-6 months. Weight savings for the boss/nozzle assembly are about 20-40 percent. A composite polar boss which attaches nozzle assemblies to solid fueled rocket motor cases is disclosed. This polar boss is a carbonized fabrication which sits within a circumferential indentation within the motor case, and has a threaded inner circumference which permits the nozzle assembly to be attached thereto. The materials of the boss are selected to permit a service temperature of up to 3,200 F. Keywords: Patents; Solid propellant; Rocket engines; Rocket engine cases; Composite materials; Weight reduction; Rocket nozzles.

0547 Carbon Fiber Reinforced Metal Matrix Composites
R. K. Everett, W. F. Henshaw
Department of the Navy, Washington, DC
Filed 28 Jun 88, patented 1 Aug 89 5p
PATENT-4 853 294 Available from Comm. of Patents
An improved metal, alloy, or intermetallic matrix composite containing carbon reinforcing fibers is formed. The carbon reinforcing fibers are protected from interaction with the matrix material by an inner and on outer barrier layer. The outer layer is any one of the group of stable, non-reactive ceramic materials used to protect fibers, and the inner layer is a ductile, low density, oxygen desorbing rare earth metal. The carbon fibers are particularly useful in forming composites with a titanium aluminide matrix. Patents.

0548 Delamination Test Apparatus and Method
J. H. Crews, J. R. Reeder
National Aeronautics and Space Administration, Hampton, VA. Langley Research Center
Filed 28 Jul 89 16p
PAT-APPL-7-386 172 Available from NTIS: price code A03
A delamination test apparatus and method uses a single beam to simultaneously apply opening and shear stresses to a test specimen. A fulcrum extending downwardly from

the beam produces shear stress in the specimen by downward movement, and opening stress by pivotal upward movement of the beam, which results by virtue of the fact that the applied load is on one side of the fulcrum while the test specimen is connected to the beam on the opposite side of the fulcrum.

0549 Eddy Current Method to Measure Distance between Scanned Surface and a Subsurface Defect
S. N. Vernon, P. M. Gammell
Department of the Navy, Washington, DC
Filed 9 Jan 89, patented 8 May 90 10p
PATENT-4 924 182 Available from Comm. of Patents
This invention relates to a method for nondestructive inspection (NDI) of composite materials comprising conductive fibers. The depth of broken fiber damage in nonmetal matrix composites such as graphite/epoxy and carbon/carbon materials may be ascertained and eddy current inspection is extended to include thick metal sections by this method. Inspection is possible with access limited to a single surface. Keywords: Patents, PAT-CL-32A-237.

0550 Fabrication by Filament Winding with an Elastomeric Material
W. H. Nakamura
Department of the Navy, Washington, DC
Filed 13 Jul 88, patented 1 May 90 8p
PATENT-4 921 557 Available from Comm. of Patents
This patent discloses an invention that relates in general to fabricating fiber-reinforced membranes using elastometric materials and, in particular, to a filament winding process suitable for fabricating flexible fiber-reinforced membranes for inflatable deployable or expandable structures capable of sustaining high structural loads or providing thermal insulation to the structure. The invention relates especially to a filament winding process for fabricating a flexible membrane which may be inflated to provide a flexible membrane which may be inflated to provide a conically shaped deployable nose fairing for a missile. Keywords: Patents, PAT-CL-156-169, Composite materials, Fabrication, Filament winding, Elastomeric materials.

Fast Optical Switch and Limiter Using Quantum Size Effect in Metal Grain Composites
See 0322

0551 Fiber Reinforced Ceramic Material
R. T. Bhatt
National Aeronautics and Space Administration, Cleveland, OH. Lewis Research Center
Filed 15 Apr 87, patented 1 Nov 88 7p
PATENT-4 781 993 Available from Comm. of Patents
A strong and tough composite material is comprised of silicon fibers and a reaction bonded silicon nitride (RBSN) matrix. This composite material SiC/RBSN may be used at elevated temperatures up to at least 1400 C.

Heterogeneous Composite and Method of Making
See 0257

0552 High Temperature Insulation Barrier Composite
J. W. Onstott
National Aeronautics and Space Administration, Huntsville, AL. George C. Marshall Space Flight Center
Filed 30 Sep 88, patented 31 Oct 89 6p
PATENT-4 877 689 Available from Comm. of Patents
A composite material suitable for providing insulation for the nozzle structure of the Space Shuttle and other similar surfaces is disclosed. The composite layer is comprised of an outer skin layer of nickel chromium and an interleaved inner region comprising a top layer of nickel chromium foil which acts as a primary convective shield. There are at least two layers of alumina batting adjacent to the layers of silicon carbide fabric. An additional layer of nickel chromium foil is used as a secondary convective shield. The composite is particularly advantageous for use as nozzle insulation because of its ability to withstand high reentry temperatures, its flexibility, oxidation resistance, low conductivity, and light weight.

0553 Impact Tolerant Material
J. S. Heyman
National Aeronautics and Space Administration, Hampton, VA. Langley Research Center
Filed 15 Mar 89, patented 27 Mar 90 7p
PATENT-4 911 062 Available from Comm. of Patents
A material is protected from acoustic shock waves generated by impacting projectiles by means of a backing. The backing has an acoustic impedance that efficiently couples the acoustic energy out of the material.

0554 Improved Process for HIP Canning of Composites
J. J. Juhas
National Aeronautics and Space Administration, Cleveland, OH. Lewis Research Center
Filed 9 Nov 89 11p
PAT-APPL-7-433 863 Available from NTIS: price code N03
A single step is relied on in the canning process for hot isostatic pressing (HIP) metallurgy composites. The composites are made from arc-sprayed and plasma sprayed monotape. The HIP can is of compatible refractory metal and is sealed at high vacuum and temperature. This eliminates outgassing during hot isostatic pressing.

Lightweight Piston Architecture
See 0131

0555 Method of Fabricating a Metal/Ceramic Composite Structure
D. Goldstein
Department of the Navy, Washington, DC
Filed 1 Jul 87, patented 2 Feb 88 5p
PATENT-4 722 825 Available from Comm. of Patents
A method of producing a metal/ceramic composite structure in which an unconsolidated metal or metal alloy powder is loaded into a sealable glass mold comprising a hollow ceramic sleeve and a sealable outer glass envelopes surrounding the ceramic sleeve and forming with the outer wall of the ceramic sleeve and a sealable chamber for the metal or metal allow powder, wherein the glass is a type which becomes plastic when heated. The air in the mold is removed under vacuum and the mold is sealed and placed into a free flowing refractory powder in a crucible and consolidated by sintering under atmospheric pressure (CAP process). Removal of the glass envelop leaves a composite article having a consolidated metal or metal alloy layer surrounding and placing a hollow ceramic linear (sleeve) under both radial and axial compression. A ceramic-line metal gun barrel insert can be produced by using a ceramic sleeve with rifling on its inner surface.

0556 Method of Insetting Predesigned Disbond Areas into Composite Laminates
G. E. Dickerson
National Aeronautics and Space Administration, Hampton, VA. Langley Research Center
Filed 23 Sep 88, patented 8 May 90 3p
PATENT-4 923 545 Available from Comm. of Patents

This invention is a process for producing composite laminates containing interlaminar disbonds of controlled sizes, shapes, and positions within a composite structure. A composite layer is provided for later inclusion within a laminate. The surfaces of this composite layer are solvent cleaned and sandblasted, except in desired disbond areas, which are coated with a releasing surface. A template to mask the bond areas is employed to obtain disbond areas of controlled shapes and sizes. The resulting composite layer is then used in the subsequent manufacture of a laminate, whereby faulty adhesion in the laminate can be studied with prior knowledge of the size, shape, and location of the disbond areas.

0557 Molybdenum disilicide matrix composite

J. J. Petrovic, D. H. Carter, F. D. Gac
Los Alamos National Lab., NM.; Department of Energy, Washington, DC
Filed 5 Jun 89 24p
PAT-APPL-7-362 112 Available from NTIS: price code A03

A composition consisting of an intermetallic compound, molybdenum disilicide, which is reinforced with VS silicon carbide whiskers dispersed throughout it and a method of making the reinforced composition. Use of the reinforcing material increases fracture toughness at low temperatures and strength at high temperatures, as compared to pure molybdenum disilicide. 3 tabs.

0558 One Step Hip Canning of Powder Metallurgy Composites

J. J. Juhas
National Aeronautics and Space Administration, Cleveland, OH. Lewis Research Center
Filed 21 Mar 89, patented 27 Feb 90 8p
PATENT-4 904 538 Available from Comm. of Patents

A single step is relied on in the canning process for hot isostatic pressing (HIP) powder metallurgy composites. The binders are totally removed while the HIP can of compatible refractory metal is sealed at high vacuum and temperature. This eliminates outgassing during hot isostatic pressing.

0559 Polycarbonate Article with Chemical Resistant Coating

J. J. Kosmo, F. S. Dawn
National Aeronautics and Space Administration, Houston, TX. Lyndon B. Johnson Space Center
Filed 30 Nov 89 10p
PAT-APPL-7-443 414 Available from NTIS: price code N03

An article of laminate construction is disclosed which is comprised of an underlayer of polycarbonate polymer material to which is applied a chemically resistant outer layer of polysulfone. The layers which are joined by compression-heat molding, are molded to form the shape of a body protective shell such as a space helmet comprising a shell of polycarbonate, polysulfone laminate construction attached at its open end to a sealing ring adapted for connection to a space suit. The front portion of the shell provides a transparent visor for the helmet. An outer visor of polycarbonate polysulfone laminate construction is pivotally mounted to the sealing ring for covering the transparent visor portion of the shell during extravehicular activities. The polycarbonate under layer of the outer visor is coated on its inner surface with a vacuum deposit of gold to provide additional thermal radiation resistance.

0560 Polymer Composite Preform and Process for Producing Same

J. J. Reilly, I. L. Kamel
Department of the Navy, Washington, DC
Filed 25 Apr 89 14p
PAT-APPL-7-343 106 Available from NTIS: price code N03

The invention described herein may be manufactured and used by or for the Government of the United States of America for governmental purposes without the payment of any royalties thereon or therefor. The present investigation relates generally to compacting polymer powder and more particularly to compacting a semicrystalline polymer-metal powder blend to form a preform having high strength and low electrical resistivity. Many avionic components are currently made of aluminum, but interest in reducing weight has promoted the development of lighter-weight thermoplastic polymers to replace the aluminum. The parts for avionic components must, however, meet stringent electromagnetic interference (EMI) shielding requirements. Consequently, the thermoplastic polymers for these EMI shielding applications must be made to be electrically conductive. Patent applications.

Scandia-Stabilized Zirconia Coating for Composites

See 0621

Silver-Nickel Composite Cathodes for Alkaline Secondary Batteries

See 0406

0561 TiN/Al2O3/TiAlON Composite

K. Han
Department of the Interior, Washington, DC
Filed 2 Apr 90 18p
PAT-APPL-7-502 709 Available from NTIS: price code N03

The present invention pertains to novel improved density ceramic composites of TiN/Al2O3/TiAlON in which there is no spinel and no AlN, but alpha-alumina, titanium nitride, and titanium aluminum oxynitride. In general, the improved density TiN/Al2O3/TiAlON ceramic composites of the invention are prepared by: adding aluminum isobutoxide (Al(O-iBu)3) to a refluxing mixture of deionized water and formic acid at elevated temperatures to obtain an aluminum sol; casting the slurry in molds; drying the cast material and calcining it at about 600 C; screening the calcined material to minus 200 mesh; pressing pellets at about 10 KPsi, isostatically pressing them at about 40 KPsi; and sintering the pellets below 1,700 C to obtain sintered bodies having densities greater than about 4.2 g/cc.

MATERIALS: Fibers & Textiles

Apparatus for Cleaning Cotton

See 0002

0562 Brominated Graphitized Carbon Fibers

C. Hung
National Aeronautics and Space Administration, Cleveland, OH. Lewis Research Center
Filed 30 Nov 89 13p
PAT-APPL-7-443 289 Available from NTIS: price code N03

Low cost, high break elongation graphitized carbon fibers having low degree of graphitization are inert to bromine at room or higher temperatures, but are brominated at -7 to 20 C, and then debrominated at ambient. Repetition of this

bromination-debromination process can bring the bromine content to 18 percent. Electrical conductivity of the brominated fibers is three times of the before-bromination value.

Ceramic Heat Pipe Wick
See 0495

0563 Crossdyeable Cotton Fabrics with Removable Wrap Size
R. J. Harper, G. F. Ruppenicker, A. P. S. Sawhney, A. H. Lambert
Department of Agriculture, Washington, DC
Filed 7 Jul 89 34p
PAT-APPL-7-376 479 Available from NTIS: price code N03
A process for producing woven cotton fabrics in which the warp yarns can be selectively piece-dyed, or in which both yarns (warp and fill) can be selectively dyed are disclosed. In the context of the invention, 'yarn' is understood to mean any fine cord of material such as thread, string, fiber or filament known and used in the art for the purpose of weaving a fabric or cloth. The process is based upon the use of a sizing formulation comprised of a crosslinking agent, a catalyst, a reactive additive to confer dyeability, and a removable sizing agent which will not react with said crosslinking agent. The sizing finish is applied to the fabric on a chemical slasher of the type normally used for applying starch or polyvinyl alcohol prior to weaving. Ideally, the sizing mix should be applied in a single application. However, because of incompatibility of substituent, a two-step application may be necessary.

Garment Pressurizing Apparatus
See 0457

0564 Method and Apparatus for Testing Materials Using Strain and Moisture Sorption
D. E. Gunderson
Forest Service, Washington, DC
Filed 30 Mar 89 20p
PAT-APPL-7-330 527 Available from NTIS: price code N03
The present invention relates to methods and apparatus for testing materials, in particular, cellulosic and polymer materials. In the invention, the moisture sorbed by a specimen is evaluated continuously by observing the change in moisture content of air in a closed volume surrounding the specimen. The relative humidity of the closed air volume is maintained constant (despite changes in the mass of water vapor in the air) by adjusting the volume, and thus total pressure, of the contained air mass. Moisture sorbed by the specimen from the air mass is calculated from the rise in total internal pressure of the closed air mass necessary to maintain a constant relative humidity. The specimen is contained in a sealed chamber of known initial volume. Instruments monitor temperature, relative humidity, internal pressure, and strain of the specimen. Void volume in the chamber is filled with air, containing some water vapor.

0565 Preparation of Mullite Whiskers from AlF(3), SiO(2), and A1(2)O(3) Powders
I. G. Talmy, D. A. Haught
Department of the Navy, Washington, DC
Filed 8 Feb 89 20p
PAT-APPL-7-307 726 Available from NTIS: price code N03
This patent application discloses a process for preparing mullite whiskers by 1) forming an anhydrous, intimate, uniform mixture of Aluminum Fluoride, Aluminum Oxide and Fused Silicon Dioxide powders in an amount selected to produce stoichiometric mullite or a solid solution of Al2O3 in stoichiometric mullite; 2) heating the mixture in anhydrous Silicon Tetrafluoride atmosphere at a temperature of from about 700 C to about 950 C to form barlike topaz crystals; 3) heating the barlike topaz in an anhydrous SiF4 atmosphere at a temperature of from about 1150 C to about 1700 C to produce the mullite whiskers. Keywords: Ceramic fibers.

0566 Sequential Oxidative and Reductive Bleaching in a Multicomponent Single Liquor System
M. Arifoglu, W. N. Marmer
Agricultural Research Service, Washington, DC
Filed 13 Jul 90 32p
PAT-APPL-7-551 381 Available from NTIS: price code N03
Objects and advantages of the invention are achieved by: A first process of the present invention which comprises, contacting fibers with hydrogen peroxide under conditions which provide oxidative bleaching of the fibers to produce bleached fibers in contact with unspent hydrogen peroxide; adding to the bleached fibers in contact with unspent hydrogen peroxide (from the previous step), a material which combines with hydrogen peroxide to form a reductive bleaching agent (e.g. thiourea) in an amount sufficient to produce a reductive bleaching media; and maintaining the oxidatively bleached fibers in said reductive bleaching media under conditions providing reductive bleaching of the bleached fibers, and; A second process of the present invention which comprises adding to the bleached fibers in contact with unspent hydrogen peroxide (from the previous step), an inactivating material in an amount at least sufficient to inactivate all of the unspent hydrogen peroxide to form an inactivated media; and subsequent to the inactivation of all the unspent hydrogen peroxide, reductively bleaching the bleached fibers by addition of a reductive bleaching agent to the inactivated media.

0567 Sequential Oxidative and Reductive Bleaching of Pigmented and Unpigmented Fibers
M. Arifoglu, W. N. Marmer
Agricultural Research Service, Washington, DC
Filed 6 Dec 89 59p
PAT-APPL-7-446 826 Available from NTIS: price code N03
The occurrence of dark (i.e. pigmented and/or stained) fibers often gives rise to annoying and expensive problems for manufacturers at all stages of fiber processing. The present invention relates to processes for oxidative (using hydrogen peroxide) and reductive bleaching of fibers, and fibers bleached by the aforementioned processes. Two processes of the instant invention which employ mordanting utilize the initial steps of: bringing both pigmented and unpigmented fibers into contact with ferrous ions under conditions which provide adsorption of the ferrous ions by the pigmented and unpigmented fibers; removing (as for example by rinsing) a portion of the ferrous ions from the pigmented and unpigmented fibers with at least a portion of the ferrous ions remaining on the pigmented fibers, and; contacting the pigmented and unpigmented fibers with hydrogen peroxide under conditions which provide oxidative bleaching of both the pigmented and unpigmented fibers, including oxidative bleaching of the pigmented fibers by interaction of the hydrogen peroxide with ferrous ions remaining on the pigmented fibers, to produce bleached fibers in contact with unspent hydrogen peroxide.

0568 Sequential Oxidative and Reductive Bleaching of Pigmented and Unpigmented Fibers
M. Arifoglu, W. N. Marmer
Agricultural Research Service, Washington, DC
Filed 13 Jul 90 60p
PAT-APPL-7-552 385 Available from NTIS: price code N03
Two processes of the instant invention which employ mordanting utilize the initial steps of: bringing both pigmented and unpigmented fibers into contact with ferrous ions under conditions which provide adsorption of the ferrous ions by the pigmented and unpigmented fibers; removing (as for example by rinsing) a portion of the ferrous ions from the pigmented and unpigmented fibers with at least a portion of the ferrous ions remaining on the pigmented fibers, and; contacting the pigmented and unpigmented fibers with hydrogen peroxide under conditions which provide oxidative bleaching of both the pigmented and unpigmented fibers, including oxidative bleaching of the pigmented fibers by interaction of the hydrogen peroxide with ferrous ions remaining on the pigmented fibers, to produce bleached fibers in contact with unspent hydrogen peroxide.

0569 System for Analyzing Cotton
W. S. Anthony, O. L. McCaskill
Agricultural Research Service, Washington, DC
Filed 7 Dec 89 17p
PAT-APPL-7-447 352 Available from NTIS: price code N03
The invention relates to analyzing cotton as it is being processed. Generally, the invention comprises moving bulk cotton (e.g., seed cotton or link cotton) through a zone partly defined by two opposing surfaces, in a pathway generally parallel to such surfaces, displacing a mass of cotton from the pathway toward a first of said two surfaces, away from the second of said surfaces, while permitting part of the cotton moving through the zone to pass therethrough without displacement; and pressing the displaced mass against such first surface so that the mass presents a face of uniform cotton density on that part of the mass which is pressed on such surface; wherein said uniform density is sufficient to enable the mass to be accurately analyzed by means such as optical or infrared scanners for at least one of the following properties: color, trash content, moisture content.

0570 System for Producing Staple-Wrapped Core Yarn
A. P. S. Sawhney, C. L. Folk, K. Q. Robert, L. B. Kimmel
Agricultural Research Service, Washington, DC
Filed 24 Jan 90 22p
PAT-APPL-7-469 120 Available from NTIS: price code N03
The patent application describes a device to produce core/wrap or wrapped core yarns more efficiently than currently used methods.

0571 Temperature Adaptable Textile Fibers and Method of Preparing Same
T. L. Vigo, C. M. Zimmerman, J. S. Bruno, G. F. Danna
Agricultural Research Service, Washington, DC
Filed 12 Mar 90 48p
PAT-APPL-7-491 905 Available from NTIS: price code N03
Temperature-adaptable textile fibers are produced by dissolving phase-change or plastic crystalline materials in a solvent such as water, thereafter filling the hollow fibers, or impregnating the non-hollow fibers, with the solution, followed by removal of the solvent. The resultant product is a modified fiber which is temperature adaptable in both hot and cold environments for as many as 150 heating and cooling cycles, by releasing heat when the temperature drops, and storing heat when the temperature rises. As such, fabrics made from such fibers may be used to protect plants and animals, may be incorporated in protective clothing, and generally speaking may be employed in environments where temperature fluctuations need to be minimized. When polyethylene glycol is used as the impregnating material, it is insolubilized on the fiber by cross-linking, and the resultant product imparts valuable properties to the fabric, e.g. soil release, durable press, resistance to static charge, abrasion resistance, pilling resistance and water absorbency.

0572 Temperature Adaptable Textile Fibers and Method of Preparing Same
T. L. Vigo, C. M. Zimmerman, J. S. Bruno, G. F. Danna
Department of Agriculture, Washington, DC
Filed 27 Jun 89, patented 13 May 90 11p
PATENT-4 908 238 Available from Comm. of Patents
Temperature adaptable textile fibers are provided in which phase-change or plastic crystalline materials are filled within hollow fibers or impregnated upon non-hollow fibers. The fibers are produced by applying solutions or melts of the phase-change or plastic crystalline materials to the fibers. Cross-linked polyethylene glycol is especially effective as the phase change material, and, in addition to providing temperature adaptability, it imparts improved properties as to soil release, durable press, resistance to static charge, abrasion resistance, pilling resistance and water absorbency.

0573 Wet Spinning of Solid Polyamic Acid Fibers
W. E. Dorogy, A. K. Saintclair
National Aeronautics and Space Administration, Hampton, VA. Langley Research Center
Filed 21 Sep 89 21p
PAT-APPL-7-410 572 Available from NTIS: price code N03
The invention is a process for the production of solid aromatic polyamic acid and polyimide fibers from a wet gel or coagulation bath wet gel using N,N-dimethylacetamide (DMAc) solution of the polyamic acid derived from aromatic dianhydrides such as 3,3',4,4'-benzo phenone tetracarboxylic dianhydride (BTDA) and aromatic diamines such as 4,4'oxydianiline (4,4'-ODA). By utilizing the interrelationship between coagulation medium and concentration, resin inherent viscosity, resin percent solids, filament diameter, and fiber void content, it is possible to make improved polyamic acid fibers. Solid polyimide fibers, obtained by the thermal cyclization of the polyamic acid precursor, have increased tensile properties compared to fibers containing macropores from the same resin system.

MATERIALS: Metals

0574 Aluminum Alloy
L. B. Blackburn, E. A. Starke
National Aeronautics and Space Administration, Hampton, VA. Langley Research Center
Filed 23 Mar 88, patented 11 Apr 89 5p
PATENT-4 820 488 Available from Comm. of Patents
This invention relates to aluminum alloys, particularly to aluminum-copper-lithium alloys containing at least about 0.1 percent by weight of indium as an essential component,

which are suitable for applications in aircraft and aerospace vehicles. At least about 0.1 percent by weight of indium is added as an essential component to an alloy which precipitates a T1 phase (Al2CuLi). This addition enhances the nucleation of the precipitate T1 phase, producing a microstructure which provides excellent strength as indicated by Rockwell hardness values and confirmed by standard tensile tests.

Arc-Textured High Emittance Radiator Surfaces
See 0534

Command Operated Liquid Metal Opening Switch
See 0315

Corrosion-Inhibiting Coating Composition
See 0595

Corrosion Resistant Metallic Glass Coatings Background of the Invention
See 0596

0575 Directional Solidification of Superalloys
D. D. Schmidt, W. S. Alter, W. D. Hamilton
National Aeronautics and Space Administration, Huntsville, AL. George C. Marshall Space Flight Center
Filed 7 Sep 89 13p
PAT-APPL-7-404 289 Available from NTIS: price code N03
This invention relates to the directional solidification of superalloys, in particular nickel-based superalloys, by imposition of a predetermined temperature profile in the solidification front and, depending on the desired results, a predetermined rate of advance of said solidification front, whereas castings of markedly superior fatigue resistance are produced.

0576 High Temperature Aluminum-Base Alloy
Y. R. Mahajan, Y. W. Kim, F. H. Froes
Department of the Air Force, Washington, DC
Filed 13 Feb 89, patented 25 Jul 89 2p
PATENT-4 851 193 Available from Comm. of Patents
In accordance with the present invention, there is provided an improved alloy consisting essentially of about 6 to 10 weight percent Fe and about 3 to 10 weight percent Gd, balance aluminum. In a presently preferred embodiment, the weight ratio of iron to gadolinium is in the range of about 1:1 to 2.2:1. In addition to aluminum, iron and gadolinium, the alloy can contain refractory metals of at least about 0.1 wt. percent and up to about 1.0 wt. percent tungsten, 1.0 wt. percent tantalum, 1.5 wt. percent molybdenum, and/or 1.5 wt. percent niobium. Preferably, the total amount of these strengtheners should not exceed about 5 wt. percent and preferably should not exceed the iron and gadolinium content. The alloys are produced by any of the known rapid solidification processes for producing particulate materials. Suitable processes include gas atomization, drum splat, twin roll atomization, chill block melt spinning, planar flow casting, and the like. Pat-420,550.

High-Temperature, Corrosion-Preventive Coating
See 0600

Improved Process for HIP Canning of Composites
See 0554

In-Situ Formation of Hardening Elements by Electrochemical Techniques
See 0076

0577 Integrated decontamination process for metals
T. S. Snyder, G. A. Whitlow
Scientific Ecology Group, Inc., Oak Ridge, TN.; Department of Energy, Washington, DC
Filed 8 Jun 89 18p
PAT-APPL-7-363 019 Available from NTIS: price code A03
An integrated process for decontamination of metals, particularly metals that are used in the nuclear energy industry contaminated with radioactive material. The process combines the processes of electrorefining and melt refining to purify metals that can be decontaminated using either electrorefining or melt refining processes.

0578 Magneto Acoustic Emission Apparatus for Testing Materials for Embrittlement
S. G. Allison, N. Min, W. T. Yost, J. H. Cantrell
National Aeronautics and Space Administration, Hampton, VA. Langley Research Center
Filed 23 Jun 88, patented 27 Mar 90 10p
PATENT-4 912 411 Available from Comm. of Patents
A method and apparatus for testing steel components for temper embrittlement uses magneto-acoustic emission to nondestructively evaluate the component. Acoustic emission signals occur more frequently at higher levels in embrittled components. A pair of electromagnets are used to create magnetic induction in the test component. Magneto-acoustic emission signals may be generated by applying an ac current to the electromagnets. The acoustic emission signals are analyzed to provide a comparison between a component known to be unembrittled and a test component. Magnetic remanence is determined by applying a dc current to the electromagnets, then turning the magnets off and observing the residual magnetic induction.

Method for Fabricating Thin Film Metallic Meshes for Use as Fabry-Perot Interferometer Elements, Filters and Other Devices
See 0342

Method for Maintaining Precise Suction Strip Porosities
See 0532

0579 Method for Refining Microstructures on Prealloyed Titanium Powder Compacts
D. Eylon, F. H. Froes
Department of the Air Force, Washington, DC
Filed 4 Dec 87, patented 23 May 89 6p
PATENT-4 832 760 Available from Comm. of Patents
This abstract discloses a method for improving the microstructure of prealloyed titanium alloy compacted articles which comprises the steps of hydrogenating the article at temperature of about 780 to 1020 C to a hydrogen level of 0.50 to 1.50 weight percent, cooling the thus-hydrogenated article to room temperature at a controlled rate, heating the thus-cooled, hydrogenated article to a temperature of about 650 to 750 C and applying a vacuum to dehydrogenate the article. Keywords: Patents.

Method of Making a Cathode from Tungsten and Iridium Powders Using a Reaction Product from Reacting Barium Peroxide with an Excess of Tungsten as the Impregnant
See 0344

0580 Method of Making a Long Life High Current Density Cathode from Tungsten and Iridium Powders Using a Mixture of Barium Peroxide and a Coated Emitter as the Impregnant
L. E. Branovich, B. Smith, G. E. Freeman, D. W. Eckart
Department of the Army, Washington, DC
Filed 20 Nov 89 9p
PAT-APPL-7-439 135 Available from NTIS: price code N03
A long life high current density cathode is made from a mixture of tungsten and iridium powders by processing the mixture of powders with an activator into a porus billet, and then impregnating the billet with a mixture of barium peroxide and a coated emitter by firing the billet in a dry hydrogen furnace at a temperature at which the impregnant melts. Patent applications; Powder metallurgy; Powder metals particle size; Coatings.

0581 Method of Marking Titanium Alloy Articles Having Distinct Microstructural Regions Corresponding to High Creep and Fatigue Resistance
D. Eylon, F. H. Froes
Department of the Air Force, Washington, DC
Filed 8 Nov 88, patented 25 Jul 89 7p
PATENT-4 851 055 Available from Comm. of Patents
A method for producing an integral titanium alloy article having at least two regions, each region having a distinct microstructure is provided. The method comprises heat treating one or more selected region(s) of the article at a temperature greater than the beta-transus temperature of the region(s), while simultaneously heat treating the remaining region(s) of the article at a temperature below the beta-transus temperature of the remaining region(s). Pat-148-20.3.

0582 Method of Soldering Aluminum
A. P. Divecha, W. A. Ferrando, P. Hesse, S. Karmarkar
Department of the Navy, Washington, DC
Filed 29 Aug 89 6p
PAT-APPL-7-401 197 Available from NTIS: price code N03
This invention relates to methods of joining metal parts and more particularly to methods of soldering aluminum. Accordingly an object of this invention is to provide a new method of soldering aluminum and its alloy. Another object of this invention is to provide treated aluminum surfaces which can easily be soldered. These and other objects of this invention are accomplished by providing a process comprising: (1) wetting an aluminum or aluminum alloy surface with molten silver nitrate; (2) heating the AgNO3 coated aluminum surface at a temperature of from the decomposition temperature of AgNO3 to about 550 C to decompose the AgNO3 and form a Ag metal film. Patent applications.

0583 Method to Produce Dispersion Strengthened Titanium Alloy Articles with High Creep Resistance
F. H. Froes, D. Eylon
Department of the Air Force, Washington, DC
Filed 6 May 88, patented 25 Jul 89 3p
PATENT-4 851 053 Available from Comm. of Patents
This invention relates to titanium alloys, particularly to dispersion strengthened titanium alloys. The high strength-to-density ratio of titanium makes it a very attractive design choice in energy-efficient high thrust-to-weight gas turbine engines or airframes of modern airplanes. In titanium, the alloying elements tend tc stabilize either the low-temperature close-packed hexagonal alpha phase, or the higher temperature allotrope, body-centered cubic beta phase. The important high-temperature properties for aerospace related applications of titanium alloys are: tensile strength, creep, fatigue initiation and fatigue crack propagation resistance, fracture toughness, hot salt stress and corrosion cracking, and oxidation resistance. It is an object of the present invention to provide a method to produce titanium alloy articles having high creep resistance. Patents.

0584 Method to Produce Titanium Alloy Articles with High Fatigue and Fracture Resistance
F. H. Froes, D. Eylon
Department of the Air Force, Washington, DC
Filed 6 May 88, patented 9 May 89 6p
PATENT-4 828 793 Available from Comm. of Patents
A method for producing an integral titanium alloy article having at least two regions, each region having a distinct microstructure, which comprises the steps of (a) providing a suitable mold for the article; (b) introducing a first titanium alloy into a first portion of the mold; (c) introducing a second titanium alloy in powder form into a second portion of the mold; and (d) hot compacting the first and second alloys in the mold to produce a substantially fully dense article. The second alloy may be the hydrided version of the first alloy, or may have a different overall composition from the first alloy, or may be hydrided and have a different overall composition from the first alloy. Pat-415-6.

One Step Hip Canning of Powder Metallurgy Composites
See 0558

0585 Pressure Rig for Repetitive Casting
P. Vasquez, W. R. Hutto, A. R. Philips
National Aeronautics and Space Administration, Hampton, VA. Langley Research Center
Filed 29 Aug 88, patented 12 Sep 89 6p
PATENT-4 865 114 Available from Comm. of Patents
The invention is a pressure rig for repetitive casting of metal. The pressure rig performs like a piston for feeding molten metal into a mold. Pressure is applied to an expandable rubber diaphragm which expands like a balloon to force the metal into the mold. A ceramic cavity which holds molten metal is lined with blanket-type insulating material, necessitating only a relining for subsequent use and eliminating the lengthy cavity preparation inherent in previous rigs. In addition, the expandable rubber diaphragm is protected by the insulating material thereby decreasing its vulnerability to heat damage. As a result of the improved design the life expectancy of the pressure rig contemplated by the present invention is more than doubled. Moreover, the improved heat protection has allowed the casting of brass and other alloys with higher melting temperatures than possible in the conventional pressure rigs.

MATERIALS: Plastics & Elastomers

Bis(4-(3,4-Dimethylenepyrrolidyl)-Phenyl) Methane
See 0066

0586 Cellular Thermosetting Fluorodiepoxide Polymers
S. Y. Lee
National Aeronautics and Space Administration, Greenbelt, MD. Goddard Space Flight Center
Filed 4 Mar 88, patented 27 Jun 89 5p
PATENT-4 843 123 Available from Comm. of Patents
Thermosetting fluoropolymer foams are made by mixing fluid form thermosetting fluoropolymer components having a substantial fluorine content, placing the mixture in a pres-

sure tight chamber, filling the chamber with a gas, at relatively low pressure, that is unreactive with the fluoropolymer components, allowing the mixture to gel, removing the gelled fluoropolymer from the chamber and thereafter heating the fluoropolymer at a relatively low temperature to simultaneously cure and foam the fluoropolymer. The resulting fluoropolymer product is closed celled with the cells storing the gas employed for foaming. The fluoropolymer resins employed may be any thermosetting fluoropolymer including fluoroepoxies, fluoropolyurethanes and fluoroacrylates.

Combination Primer/Topcoat Coating
See 0537

Fluoroaliphatic Polyamide Synthesized via Peptide Blocking Group and Coupling Technique
See 0075

High Temperature Insulators
See 0601

0587 Novel Polyimide Compositions Based on 4,4': Isophthaloyldiphthalic Anhydride (Idpa)
J. R. Pratt, T. L. Saintclair
National Aeronautics and Space Administration, Hampton, VA. Langley Research Center
Filed 28 Apr 89 25p
PAT-APPL-7-344 877 Available from NTIS: price code N03
A series of twelve high temperature, high performance polyimide compositions based on 4,4'-isophthaloyl diphthalic anhydride (IDPA) was prepared and characterized. Tough, film-forming, organic solvent-insoluble polyimides were obtained. Three materials were semicrystalline. Several gave excellent long-term thermooxidative stability by isothermal thermogravimetric analysis (ITGA) at 300 C and 350 C in air when compared to Kapton H film (duPont). One extensively studied material displayed different levels of semicrystallinity over a wide range of final cure time/temperatures. The polyimide from IDPA and 1,3-bis (4-aminophenoxy 4'-benzoyl) benzene exhibited multiple crystallization and melting behavior, implying the existence of two kinetic and two thermodynamic crystallization and melting transitions by differential scanning calorimetry

Plastics Having Inert, Vapor-Impermeable, Diamond Like Carbon Coatings Thereon
See 0617

Polycarbonate Article with Chemical Resistant Coating
See 0559

Polyimides with Carbonyl and Ether Connecting Groups Between the Aromatic Rings
See 0090

Polymer Composite Preform and Process for Producing Same
See 0560

0588 Semi-Foamed Polyethylene Molding Tape
R. J. Phillips, D. O'Brien
Department of the Navy, Washington, DC
Filed 12 Dec 86, patented 26 Jul 88 6p
PATENT-4 759 973 Available from Comm. of Patents
The present invention relates to an insulated covering for electrical hardware and more particularly to a tape covering for bonding a cable jacket to the strength member of an electrical connector for use in a cable system that is buoyant in seawater. A semi-foamed polyethylene tape for use in the molding of foamed jacket polyethylene cables is disclosed. After tumble mixing low density foaming polyethylene, ethylene vinyl acetate co-polymer and polyethylene color concentrate, the tape is extruded on a thermoplastic extruder having a maddox-mixing screw that effectively mixes polyethylene compounds and a slot die with a suitable opening dimension. The tape is then quenched. By controlling manufacturing variables the tape is foamed to 40% to 50% of its maximum. The tape is then foamed to 100% maximum during the manufacturing of a cable assembly. Keywords: Patents, Electric cables, Electric connectors.

Some 1-(Diorganooxyphosphonyl)Methyl-2,4- and -2,6-Dinitro-Benzenes
See 0097

Temperature Adaptable Textile Fibers and Method of Preparing Same
See 0572

0589 Vibration Damping Composition Suitable for Outer Space Temperature Variations
C. E. Blevins
Department of the Air Force, Washington, DC
Filed 19 Apr 88, patented 18 Apr 89 4p
PATENT-4 822 834 Available from Comm. of Patents
It is thus a principal object of the invention to provide an improved constrained layer composite damping material having a high loss factor throughout an extended temperature range of about -100 F. to +160 F. The composition of the present invention includes a composition of two different elastomers, a thermoplastic polymer, a plasticizer and a reinforcing filler. The first elastomer has a glass transitional point temperature f -50 F., the second elastomer has a glass transitional point temperature of +60 F. and the thermoplastic material has a glass transitional point temperature of +130 F. PAT-524-427.

MATERIALS: Other

Aligned Bismuth, Strontium, Calcium Cuprate Coatings on Polycrystalline Substrates
See 0893

0590 Alloying of Metals for Corrosion Resistance
E. McCafferty, G. K. Hubler, P. M. Natishan
Department of the Navy, Washington, DC
Filed 29 Sep 89 19p
PAT-APPL-7-414 223 Available from NTIS: price code N03
The corrosion resistance of bulk metals is improved by implanting a corrosion-resistant species into the surface of the bulk metal in a layer beginning at the surface and extending to a depth of at least about 50 angstroms. An amount of corrosion-resistant species is deposited so that the oxide layer that forms on the corrosion-resistant species implanted bulk metal is composed of at least about three percent of the oxide of the corrosion-resistant species. Patent applications.

0591 Annealing Group III-V Compound Doped Silicon-Germanium Alloy for Improved Thermo-Electric Conversion Efficiency
J. W. Vandersande, C. Wood, S. L. Draper
National Aeronautics and Space Administration, Pasadena, CA. Pasadena Office
Filed 21 Apr 88, patented 18 Jul 89 8p
PATENT-4 849 033 Available from Comm. of Patents

The thermoelectric conversion efficiency of a GaP doped SiGe alloy is improved about 30 percent by annealing the alloy at a temperature above the melting point of the alloy, preferably stepwise from 1200 C to 1275 C in air to form large grains having a size over 50 microns and to form a GeGaP rich phase and a silicon rich phase containing SiP and SiO2 particles.

Automatic Prestart or Post Shutoff Engine Lubricator
See 0125

0592 Bleaching Lignocellulosic Pulps with Light, Oxygen, Water and Semiconductor Powders
E. L. Springer
Forest Service, Washington, DC
Filed 5 Dec 88 9p
PAT-APPL-7-280 397 Available from NTIS: price code N03
The object of the invention is to eliminate or reduce the need for chlorine containing compounds in bleaching lignocellulosic pulp. Wood pulp is bleached (brightened) when treated in aqueous suspension with air, light and ordinary polycrystalline semiconductor powder catalyst such as zinc oxide or titanium dioxide. At pH levels at which the catalyst remains insoluble and thus active for heterogeneous bleaching; and insoluble for recovery, bleaching of the pulp results in an heretofore unknown manner. In theory, photons of light striking the suspended semiconductor-powder are absorbed and each photon promotes an electron from the valence band to the conduction band. Electrons in the conduction band travel to the dark side particle surface where they reduce dissolved oxygen molecules in the adjacent aqueous phase. The so-called holes (absence of electrons) travel to the light side particle surface where they oxidize the adjacent pulp fibers. Intermediate organic or inorganic molecules or ions may be involved in transferring the oxidation from the particle surface to the pulp fiber surface. The exact mechanism is, as yet, unknown.

Boron-Containing Organosilane Polymers and Ceramic Materials Thereof
See 0067

Brominated Graphitized Carbon Fibers
See 0562

Cast-On Surfacing of Evaporative Pattern Castings
See 0535

Ceramic Heat Pipe Wick
See 0495

0593 Ceramic Heat Pipe Wick
B. Seidenberg, T. Swanson
National Aeronautics and Space Administration, Greenbelt, MD. Goddard Space Flight Center
Filed 31 Jan 89, patented 28 Nov 89 7p
PATENT-4 883 116 Available from Comm. of Patents
A wick for use in a capillary loop pump heat pipe is disclosed. The wick material is an essentially uniformly porous, permeable, open-cell, silicon dioxide/aluminum oxide inorganic ceramic foam having a silica fiber ratio, by weight, of about 78 to 22, respectively, a density of 6 lbs/cu ft, and an average pore size of less than 5 microns. A representative material having these characteristics is Lockheed Missile and Space Company, Inc.'s HTP 6-22. This material is fully compatible with the freons and anhydrous ammonia and allows for the use of these very efficient working fluids, and others, in capillary loops.

Combination Primer/Topcoat Coating
See 0537

Compact Drill Sampler for Quantitation of Microorganisms in Wood
See 0446

0594 Conductive ceramic composition and method of preparation
J. L. Smith, E. H. Kucera
Argonne National Lab., IL.; Department of Energy, Washington, DC
Filed 26 May 89 18p
PAT-APPL-7-357 247 Available from NTIS: price code A03
This report describes the fabrication of a ceramic anode formed of a multivalent metal oxide or oxygenate such as an alkali metal, transition metal oxygenate. The anode is prepared as a non-stoichiometric crystalline structure by reaction and conditioning in a hydrogen gas cover containing minor proportions of carbon dioxide and water vapor. The structure exhibits a single phase and substantially enhanced electrical conductivity over that of the corresponding stoichiometric structure. Unexpectedly, such oxides and oxygenates are found to be stable in the reducing anode fuel gas of a molten carbonate fuel cell.

Copper Chloride Cathode for a Secondary Battery
See 0399

0595 Corrosion-Inhibiting Coating Composition
W. E. Knight, K. G. Clark, D. L. Gauntt
Department of the Navy, Washington, DC
Filed 1 Mar 90 12p
PAT-APPL-7-486 689 Available from NTIS: price code N03
This invention relates to corrosion inhibiting compositions and particularly to compositions capable of forming films on metal substrates to protect said metal from corrosion. The film forming compositions which are capable of displacing moisture from the metal surface comprises effective amounts of an acrylic resin, a silicone resin and a copolymer derived from a silicone and alkyd monomers. These resins together with effective amounts of an organic phosphate and a sulfonate are used in combination with lower molecular weight alcohols and at least one solvent. Patent applications.

0596 Corrosion Resistant Metallic Glass Coatings Background of the Invention
L. T. Kabacoff
Department of the Navy, Washington, DC
Filed 1 Mar 90 23p
PAT-APPL-7-486 655 Available from NTIS: price code N03
This invention relates to amorphous metal alloys and particularly to amorphous metal alloy coatings for protecting metals against corrosion. Metallic glasses are relatively new materials that are produced in the form of ribbons, wires, or coatings by rapid solidification from either the liquid or vapor state. They are truly noncrystalline alloys which combine the properties of a metal (electrical conductivity, metallic luster, etc.) with the lack of long range order typical of a glass. They are very homogeneous and lack the defects typical of a crystalline material, such as grain boundaries and dislocations. Patent applications.

Crossdyeable Cotton Fabrics with Removable Wrap Size
See 0563

0597 Delignification of Lignocellulosic Materials with Monoperoxysulfuric Acid
E. L. Springer, J. L. Minor
Forest Service, Washington, DC
Filed 30 Mar 89 30p
PAT-APPL-7-330 547 Available from NTIS: price code N03
The invention describes a new and useful method for removing lignin from lignocellulosics to produce cellulosic pulps for use in papermaking, bleached pulps, regenerated cellulosic products and pulps having increased food value due to greater carbohydrate digestibility as a result of lignin removal from a lignocellulosic material and any other product in which the removal of lignin from a lignocellulosic is beneficial. Lignocellulosics, such as straw, wood and wood in various forms of separation or preparation such as fiberized wood, wood meal or destructured wood chips can be effectively, and when desired almost totally, delignified by monoperoxysulfuric acid (H_2SO_5 or Caros acid) in strongly acidic solutions having pH less than two. Although the delignifying solutions are strongly acidic, pulp with good strength properties can be obtained.

Energy Beam Treatment for Improved Adhesion of Coatings to Surfaces
See 0538

0598 Fatigue Testing Apparatus
R. J. Buzzard
National Aeronautics and Space Administration, Cleveland, OH. Lewis Research Center
Filed 21 Aug 89 14p
PAT-APPL-7-396 263 Available from NTIS: price code A03
An apparatus is provided for obtaining a single crack in fatigue loading which emanates from a predetermined starting notch in a test specimen. This crack propagates in a direction in line with that of the applied Mode 2 load. The loading may be performed either monotonically or in a cyclic fatigue.

High Gloss Corrosion-Resistant Coatings
See 0539

0599 High Strength Particulate Ceramics
K. Liles, J. Hoyer, K. Miynarski
Department of the Interior, Washington, DC
Filed 12 Jun 89 8p
PAT-APPL-7-367 646 Available from NTIS: price code A02
The invention relates to new and useful hard, dense, composite materials made from metallic nitrides such as titanium nitride when combined with aluminum oxide and aluminum nitride and a process comprising the steps of: (1) mixing constituent materials using kerosene as a mixing medium; (2) screening, settling, filtering, and washing the mixture in acetone; (3) filling and sealing said materials in a latex mold; (4) isostatically pressing the material into a compacted powder; and (5) sintering the compacted powder in a gas atmosphere at 1,850 deg. C for two hours.

0600 High-Temperature, Corrosion-Preventive Coating
S. J. Spadafora
Department of the Navy, Washington, DC
Filed 31 Mar 90 8p
PAT-APPL-7-331 705 Available from NTIS: price code N03
This patent discloses coatings which prevent corrosion and are thermally stable at high temperatures. Many metal surfaces require the protection of a coating which will resist temperatures of 500 F deg to 700 deg F and also protect the metal surface against corrosion. Keywords: Patents, Corrosion, Inhibition, Coatings, Metals, S/N 331, 705.

0601 High Temperature Insulators
J. P. Newhouse, R. A. Rhein
Department of the Navy, Washington, DC
Filed 25 Aug 87, patented 18 Oct 88 5p
PATENT-4 778 871 Available from Comm. of Patents
An object of this invention is to provide an ablative, high-temperature silphenylene-vinylmethylsiloxane elastomer having good thermal stability as well as good mechanical properties. Another object of this invention is a process for producing a high temperature, high impact, erosion resistant silphenylene-vinylmethylsiloxane elastomer. This patent describes a high temperature, high impact, erosion resistant silphenylene-vinylmethylsiloxane elastomer and a process for making the same in which a liquid hydroxyl-terminated silphenylene vinylmethylsiloxane polymer is cured using a combination of hydrosilylation cure and urethane cure techniques. Keywords: Pat-CL-528-183.

0602 High Temperature Ultrasonic Testing of Materials for Internal Flaws
D. S. Kupperman, M. Linzer
Department of Labor, Washington, DC
Filed 23 Aug 88, patented 6 Feb 90 6p
PATENT-4 898 034 Available from Comm. of Patents
An apparatus is disclosed for nondestructive evaluation of defects in hot materials, such as metals and ceramics, by sonic signals, which includes a zirconia buffer in contact with a hot material being tested, a liquid couplant of borax in contact with the zirconia buffer and the hot material to be tested, a transmitter mounted on the zirconia buffer sending sonic signals through the buffer and couplant into the hot material, and a receiver mounted on the zirconia buffer receiving sonic signals reflected from within the hot material through the couplant and the buffer.

0603 Hydrostatic self-aligning axial/torsional mechanism
D. G. O'Connor, H. L. Gerth
Oak Ridge National Lab., TN.; Department of Energy, Washington, DC
Filed 23 May 89 13p
PAT-APPL-7-355 585 Available from NTIS: price code A03
The present invention is directed to a self-aligning axial/torsional loading mechanism for testing the strength of brittle materials which are sensitive to bending moments. Disposed inside said self-aligning loading mechanism is a frictionless hydrostatic ball joint with a flexure ring to accommodate torsional loads through said ball joint. 2 figs.

Ionizing radiation detector
See 0423

0604 Lightweight Ceramic Insulation and Method
D. J. Green
National Aeronautics and Space Administration, Houston, TX. Lyndon B. Johnson Space Center
Filed 30 Jun 88, patented 24 Apr 90 4p
PATENT-4 919 852 Available from Comm. of Patents
A process is disclosed for manufacturing a low density ceramic powder which can be formed to make a lightweight material for insulation or other construction. The ceramic product made from the process has a final density of less than 25 to about 1 percent of the theoretical weight of the ceramic powder. The ceramic product is lightweight and

can be made to withstand high temperatures greater than 1400 C.

0605 Low-loss binder for hot pressing boron nitride
L. Maya
Oak Ridge National Lab., TN.; Department of Energy, Washington, DC
Filed 2 Jun 89 12p
PAT-APPL-7-360 561 Available from NTIS: price code A02
This report describes an invention utilizing Borazine derivatives as low-ioss binders and precursors for making ceramic boron nitirde structures. The derivative forms the same composition as the boron nitride starting material, thereby filling the voids with the same boron nitride material upon forming and hot pressing. The derivatives have a further advantage of being low in carbon thus resulting in less volatile byproduct that can result in bubble formation during pressing.

Magneto Acoustic Emission Apparatus for Testing Materials for Embrittlement
See 0578

0606 Metal Ternary Sulfides
J. Covino, M. E. Hills
Department of the Navy, Washington, DC
Filed 30 Sep 85, patented 1 Mar 88 3p
PATENT-4 728 682 Available from Comm. of Patents
This invention is related to transmitting ceramic materials and, more particularly, to ternary sulfides useful as infrared materials such as in windows and missile domes. This invention also relates to a new synthesis of metal sulfides. Infrared transmitting materials are necessary for sensor windows and domes on satellites, missiles and other similar devices. These materials must be chemically stable, abrasion resistant, have low coefficients of thermal expansion, high melting temperatures and good optical transmission characteristics in the desired region of the infrared. This patent relates to metal ternary sulfides of the general formula MM2S4 that are synthesized by introducing stoichiometric amounts of nitrate precursors in concentrated nitric acid and heating to approximate dryness to yield a homogeneous powder mixture. The mixture is then exposed to a gaseous H2S atmosphere under controlled conditions to produce the desired sulfide. Keywords: Ceramics; Infrared materials.

0607 Method and Apparatus for Testing Materials Using Strain and Moisture Sorption
D. E. Gunderson
Department of Agriculture, Washington, DC
Filed 30 Mar 89, patented 19 Jun 90 2p
PATENT-4 934 181 Available from Comm. of Patents
The invention discloses test methods and apparatus for evaluating the mechano-strain response of various materials, particularly paper and related materials. The moisture sorbed by a specimen is evaluated continuously by observing the change in moisture content of the air in a closed volume surrounding the specimen. The relative humidity of the closed air volume is maintained constant (despite changes in the mass of water vapor in the air) by adjusting the physical volume, and thus the total pressure, of the contained air mass. In a second form, the pressure is adjusted directly. Moisture sorbed by the specimen is calculated from the rise in internal pressure of the closed air mass needed to hold relative humidity constant.

Method for Assessment of Corrosion Activity in Reinforced Concrete
See 0122

0608 Method for Stabilization of Pan-Based Carbon Fibers
L. H. Peebles
Department of the Navy, Washington, DC
Filed 30 Jun 89 11p
PAT-APPL-7-373 980 Available from NTIS: price code N03
This invention relates to carbon fibers, and more particularly, to an improved process for stabilizing polyacrylonitrile (PAN) based fibers prior to carbonization and high-temperature heat treatment. There has been an increasing demand for construction materials of high strength-to-weight ratio and high Young's modulus for use in civilian and military applications, particularly for materials that have good thermal stability. Accordingly, there has been a demand for improved reinforcing fibers to be embodied in structural composites which are exposed to conditions of high temperature and high mechanical stress. Carbon fibers are produced in five manufacturing steps: polymerization of monomers, such as acrylonitrile; orientation of the linear polymer molecules by spinning them into fibers; stabilization by heating the fibers to 150-350 C. Patent applications.

0609 Method for thermal processing alumina-enriched spinel single crystals
C. M. Jantzen
Du Pont de Nemours (E.I.) and Co., Aiken, SC.; Department of Energy, Washington, DC
Filed 8 Jun 89 18p
PAT-APPL-7-363 020 Available from NTIS: price code A03
A process is described for age-hardening alumina-rich magnesium aluminum spinel to obtain the desired combination of characteristics of hardness, clarity, flexural strength and toughness. The process comprises selection of the time-temperature pair for isothermal heating followed by quenching. The time-temperature pair is selected from the region wherein the precipitate groups have the characteristics sought. The single crystal spinel is isothermally heated and will, if heated long enough pass from its single phase through two pre-precipitates and two metastable precipitates to a stable secondary phase precipitate within the spinel matrix. Quenching is done slowly at first to avoid thermal shock, then rapidly. 10 figs.

0610 Method of Growing Industrial Grade Diamond
R. A. Neifeld
Department of the Army, Washington, DC
Filed 18 Dec 89 7p
PAT-APPL-7-451 698 Available from NTIS: price code N03
This patent application discloses a method for growing industrial grade diamonds from a transparent carbon and hydrogen containing liquid by subjecting the liquid to at least one focused high intensity laser pulse. Keywords: YAG lasers; Benzene; Laser applications; Diamonds growth.

Method of Identifying the Composition of a Material Sample
See 0045

0611 Method of Making Carbon Dioxide and Chlorine Free Fluoride-Based Glass
J. J. Hutta
Department of the Air Force, Washington, DC
Filed 20 Jun 88, patented 27 Jun 89 4p
PATENT-4 842 631 Available from Comm. of Patents
The present invention relates to an improved method of making fluoride-base glass free of certain contaminants, and in particular, free of carbon dioxide and chlorine. Considerable effort has expended to develop heavy metal fluoride glasses ('HMFG') as a viable family of infrared-transparent optical-materials for application as fiber waveguides and as bulk optical components. The present process is directed to typical heavy metal fluoride glasses of the compositions: (XF4 + BaF2 + LaF3 + ALF3 + YF) where X is either zirconium or hafnium and Y can represent sodium, lithium, lead, indium, or no addition. For example, the melt mixture may contain multi-component fluorides, or, alternatively, the mixed oxides or oxyfluorides plus ammonium bifluoride (NH4HF2) in a crucible, preferably made of a nonreactive inert precious metal such as platinum, platinum alloys or gold but also including vitreous or pyrolytic carbon. This crucible is placed within a furnace contained within a vacuum chamber. The chamber is evacuated to around 110 torr and then backfilled with sulphur hexafluoride (SF6) to a slight positive pressure. The mixture is then rapidly heated to about 800 + or - 10 C., held there at temperature for a brief period then rapidly cooled. The present invention is a process of providing, high optical quality heavy metal fluoride glasses that lack devitrification, straie, seed, internal bubbles, crystalline inclusions, dissolved CO2 and chlorine contamination or other defects and inhomogeneities common in glasses of this type. Patents.

Method of Preparing a Thin Diamond Film
See 0541

Method of Preparing Radially Homogeneous Mercury Cadmium Telluride Crystals
See 0913

Method of Radiographic Inspection of Wooden Members
See 0489

Molybdenum disilicide matrix composite
See 0557

0612 Molybdenum Disulfide-Molybdenum Oxide Lubricants
P. W. Centers
Department of the Air Force, Washington, DC
Filed 13 Apr 88, patented 9 May 89 4p
PATENT-4 828 729 Available from Comm. of Patents
This abstract discloses a solid lubricating material consisting essentially of an intimate mixture of about 15 to 50 mole percent molybdenum trioxide, balance molybdenum disulfide. The material is particularly useful under extreme environmental conditions such as very high temperature or vacuum. The material may be used in powder form, compacted into a pellet or other desired shape, incorporated into a grease composition or incorporated into a resin-bonded solid film lubricant. Patents.

0613 Mullite Whisker Preparation
I. G. Talmy, D. A. Haught
Department of the Navy, Washington, DC
Filed 6 Jul 87 18p
PAT-APPL-7-070 757 Available from NTIS: price code N03
This invention relates to mullite and more particularly to the preparation of mullite whiskers. Accordingly, an object of this invention is to provide a new method of producing mullite whiskers. Another object of this invention is to provide a method of producing high purity stoichiometric mullite whiskers. A further object of this invention is to provide a simpler, less expensive method of producing high purity stoichiometric mullite whiskers. Patent applications.

0614 Multiple Bandmill for Making a Plurality of Sawlines in the Same Longitudinal Plane at One Time
J. D Danielson, D. W. Lewis
Forest Service, Washington, DC
Filed 17 Jan 89 12p
PAT-APPL-7-297 786 Available from NTIS: price code N03
It is a main object of the present invention to provide a new and novel multiple bandmill for sawing logs and cants which eliminates lumber size variation caused by relief of growth stresses.

0615 New Class of Lubricants Derived from Archaebacterial Lipids
E. L. Chang
Department of the Navy, Washington, DC
Filed 29 Nov 89 13p
PAT-APPL-7-442 961 Available from NTIS: price code N03
A new class of lubricants based on the general features of archaebacterial lipids but not limited to lipids solely extracted from archaebacteria is described. These lubricant/additive molecules have the following features: bipolarity, ether bonds and branched biphytanyl chains. They can be double chained or single chained. This new class has the potential to be highly thermally and chemically stable due to the above mentioned features. Keywords: Patent applications.

0616 Nondestructive material characterization
V. A. Deason, J. A. Johnson, K. L. Telschow
EG and G Idaho, Inc., Idaho Falls.; Department of Energy, Washington, DC
Filed 14 Jul 89 21p
PAT-APPL-7-379 832 Available from NTIS: price code A03
A method and apparatus for nondestructive material characterization, such as identification of material flaws or defects, material thickness or uniformity and material properties such as acoustic velocity. The apparatus comprises a pulsed laser used to excite a piezoelectric (PZ) transducer, which sends acoustic waves through an acoustic coupling medium to the test material. The acoustic wave is absorbed and thereafter reflected by the test material, whereupon it impinges on the PZ transducer. The PZ transducer converts the acoustic wave to electrical impulses, which are conveyed to a monitor.

Novel Phenol Derivative and Process for the Production of the Same
See 0085

Organic Cathode for a Secondary Battery
See 0403

Plasma Gun with Coaxial Powder Feed and Adjustable Cathode
See 0470

0617 Plastics Having Inert, Vapor-Impermeable, Diamond Like Carbon Coatings Thereon
R. Berger
National Institutes of Health, Bethesda, MD
Filed 30 Mar 90 23p
PAT-APPL-7-502 121 Available from NTIS: price code N03
The present invention is concerned with providing advantageous plastic materials and plastic coatings having impermeable, inert coatings thereon, and the preparation of such plastics using duel ion beam enhanced deposition techniques. Several different methods are available for depositing diamond and diamond-like films on substrates, for example, plasma assisted carbon vapor deposition, direct ion beam processes and ion beam enhanced deposition. One object of the present invention is to provide a diamond like carbon coating on a plastic material (which may be flexible) by utilizing a dual ion beam enhanced deposition technique. Further, it is an object of the present invention that such a coated plastic material prepared in such a manner should be chemically and biologically inert, as well as impermeable to water and/or chemical vapors.

0618 Porous Ceramic Bodies
C. A. Andersson, D. P. Partlow, B. E. Yoldas
Department of the Air Force, Washington, DC
Filed 5 Feb 87, patented 9 May 89 4p
PATENT-4 828 774 Available from Comm. of Patents
This invention relates to porous ceramic bodies. Renewed interest in lightweight porous ceramics has been stimulated by the need for materials having low thermal expansion, low dielectric constant, and/or low density for certain high-tech applications. It is an object of the present invention to provide an improved method for fabricating porous ceramic bodies. In accordance with the present invention there is provided an improved method for making a lightweight porous ceramic body which comprises the steps of: providing a ceramic polymer solution; blending high-strength fibers with the polymer solution to provide a mixture; felting the mixture; drying the resulting felt; and firing the dried felt. Alternatively, the fibers may be felted, then impregnated with the ceramic polymer solution, then dried and fired. The polymer solution is an inorganic oxide network containing glass-forming elements such as Si, Al, Ti, Zr and the like and optionally, modifying elements such as Mg, B and the like. The oxide network is formed by controlled hydrolysis of an organo-metallic compound such as a metal alkoxide. Keywords: Patents.

0619 Porous ceramics and method for making
R. H. Reiner, C. E. Holcombe
Oak Ridge National Lab., TN.; Department of Energy, Washington, DC
Filed 8 Jun 89 9p
PAT-APPL-7-362 991 Available from NTIS: price code A02
The fabrication of a porous ceramic composite is described. Fumed silica particles are coated with a nitrate, preferably aluminum nitrate. Next the nitrate is converted to an oxide and formed into a desired configuration. This configuration is heated to convert the oxide to an oxide silicate which is then react with HF, resulting in the fluoride ceramic, preferably aluminum fluoride.

Predictive Aging of Polymers
See 0091

Preparation of Mullite Whiskers from AlF(3), SiO(2), and A1(2)O(3) Powders
See 0565

Process for Crosslinking Methylene-Containing Aromatic Polymers with Ionizing Radiation
See 0092

Process of Three Dimensional Lithography in Amorphous Polymers
See 0094

0620 Production of Microporous Finely Divided Matrix Material with Nuclear Tracks from an Isotropic Source and Product Thereof
B. S. Carpenter, C. Horvath, C. R. Vogt
National Inst. of Standards and Technology, Gaithersburg, MD
Filed 22 May 86, patented 16 May 89 6p
PATENT-4 830 917 Available from Comm. of Patents
The present invention relates to the production of a finely divided matrix material having substantially uniform porosity about the surface thereof and having micropores of controlled size and number density. The microporous matrix material is produced with charged particle tracks resulting from an isotropic source, a portion of which tracks break the surface of the matrix material, followed by etching the latent tracks to produce pores of the desired size. The isotropic source must be selected such that it emits charged particles capable of leaving a damage track in the matrix material and includes selected nuclides which emit protons, tritons, alphas and fission fragments such as U-235, U-238, Th-232, L-7, B-10 and the like. Neutrons are selected as the irradiation source to trigger the isotropic source because of their high penetrability such that bulk quantities of matrix material can be subjected to very uniform radiation.

0621 Scandia-Stabilized Zirconia Coating for Composites
R. L. Jones, R. P. Ingel
Department of the Navy, Washington, DC
Filed 27 May 88, patented 3 Apr 90 11p
PATENT-4 913 961 Available from Comm. of Patents
This invention relates to vanadium and sulfur compound corrosion - resistant ceramic coatings. More particularly, this invention relates to scandia-stabilized zirconia coatings and composites formed with them. As demands increase on fuel resources and as manufacturing techniques become more complex, industrial equipment is exposed to fuels and materials which contain corrosive contaminants. These corrosive contaminants can cause extensive damage to the surface and structure of industrial equipment, particulary to all types of motors, turbines, engines, furnaces, stacks, fluidized beds and the like. Pat-CL-428-472.

0622 Self-Feeding Wood Chunker
R. Arola, J. Marks
Forest Service, Washington, DC
Filed 20 Mar 89 14p
PAT-APPL-7-325 804 Available from NTIS: price code N03
The present invention relates to a self-feeding wood chunker comprising (two) cutting instruments rotating in opposite directions but with the same speed, which have, on surfaces facing one another, at least one cutting blade, the blades being curved in the direction of rotation such that the leading part thereof is nearer to the periphery of the respective cutting instrument and that the trailing part thereof

is nearer to the axis of rotation of the respective cutting instrument.

0623 Sensor Based on a Tunneling Tip Detector
J. H. Wandass, R. J. Colton, J. S. Murday
Department of the Navy, Washington, DC
Filed 26 Feb 90 55p
PAT-APPL-7-484 950 Available from NTIS: price code N03
This invention relates generally to a tunneling-tip based sensor, and especially to a sensor for detecting changes in the physical properties of materials subjected to various environments. Sensors may be used to detect conditions in the environment or to determine the effect of these conditions on a particular material. For example, sensors are currently used to detect, inter alia acoustic fields, electrical fields, magnetic fields and temperature, as well as the effects of changes in these conditions upon the physical characteristics of various materials. Generally a compact sensor having high sensitivity is preferred. Keywords: Patent applications.

Temperature Stable Ceramic Dielectric Compositions
See 0273

TiN/Al2O3/TiAlON Composite
See 0561

MEDICINE, BIOLOGY, & HUMAN FACTORS: Human Factors

0624 Device for Regulating Luminous Flux of Battery Powered Headlamp
D. S. Gasvoda
Forest Service, Washington, DC
Filed 1 Feb 89 12p
PAT-APPL-7-305 316 Available from NTIS: price code N03
The invention relates to a small, lightweight, highly efficient portable device for regulating the luminous flux output of a battery powered headlamp. Wildland firefighters use a hard-hat mounted headlamp to provide illumination for night fire suppression activities. It is desirable to have the headlamp and battery both located on the hard-hat to eliminate the need for an interconnecting cord which could entangle in brush. The headlamp and battery must be lightweight so as to not burden the firefighter and the battery must contain sufficient energy to power the headlamp for a complete night shift. Also, the light output must remain sufficient to provide adequate illumination for safe working conditions.

0625 Multi-Adjustable Headband
P. C. Toole, H. E. Chalson, W. S. Bussey
National Aeronautics and Space Administration, Cocoa Beach, FL. John F. Kennedy Space Center
Filed 8 Aug 86, patented 8 Nov 88 11p
PATENT-4 783 822 Available from Comm. of Patents
This invention relates to a headband for a headset having separate coarse and fine adjustment features. The adjustments may be to the axial distance between at least one earpiece element and a side support. Such adjustment to the axial distance varies the pressure exerted on the head of the user. The present fine adjustment feature may be used while the headset is being worn, thereby permitting a user to optimize the amount of pressure between the contending criteria of comfort and keeping the headset in place on the user's head.

Sequential Rapid Communication Visual Displays
See 0373

Temperature Adaptable Textile Fibers and Method of Preparing Same
See 0571

MEDICINE, BIOLOGY, & HUMAN FACTORS: Instruments & Equipment

0626 Accurate Hand Movement Assistance
D. W. Repperger, A. Morris
Department of the Air Force, Washington, DC
Filed 5 Jun 87, patented 27 Jun 89 6p
PATENT-4 842 607 Available from Comm. of Patents
This invention relates to the filed of prosthesis apparatus for use in achieving precision movement and overcoming neurological dysfunction movements of a human limb. The present invention provides for assisted movement of a human limb such as a hand and its appendages, and is usable in a variety of conditions wherein the unassisted movement provided by the human subject is unsatisfactory for accomplishing a predetermined task. Principal uses contemplated, therefore, for the invention include assistance to impaired function patients and extension of the normal range of human movements into the realm of greater precision and smaller dimensional capabilities. Patents; Prosthetics.

Apparatus for Hyperthermia Treatment of Cancer
See 0694

0627 Apparatus for Imaging Deep Arterial and Coronary Lesions
J. A. Rooney, R. C. Heyser, D. H. Lecroissette
National Aeronautics and Space Administration, Pasadena, CA. Pasadena Office
Filed 1 Dec 89 24p
PAT-APPL-7-444 248 Available from NTIS: price code N03
A reflection-mode ultrasonic system uses time-delay spectrometry (TDS) for imaging of variations in a property of deep arterial and coronary tissue within a volume at a range from a transmitting transducer. A receiving transducer mounted concentric with the transmitting transducer provides a return signal that is demodulated by the sweep of the TDS using a balanced mixer to present a complex signal representative of a property within a volume of tissue. The complex signal is amplified and filtered before mixing with a frequency signal from a local generator to establish a zero range reference for A-scan display of the return signal, but before display the offset return signal is transformed by a fast Fourier transform processor from the frequency domain to a time domain to present the return signal for display as a time-based range signal. A B-scan display may be provided by additionally scanning the transducers in a linear path across the tissue.

0628 Array-Type Multiple Cell Injector
S. V. Leighton
National Institutes of Health, Bethesda, MD
Filed 23 Oct 89 17p
PAT-APPL-7-425 254 Available from NTIS: price code N03
The invention relates to injection devices, and more particularly to structures for substantially simultaneous injection of a medium into a plurality of individual cells.

Bio-Reactor Chamber
See 0695

0629 Breath Sampler (II)
R. Glaser
National Institutes of Health, Bethesda, MD
Filed 11 Jan 90 51p
PAT-APPL-7-463 574 Available from NTIS: price code N03
The invention relates to methods and devices for measuring and analyzing contents of gas samples, and more particularly to a method and apparatus for sampling volumetric quantities of human exhaled breath, and then either performing on-site analyses for measuring volatile compounds present in the sampled volume of breath, or storing the sampled volume so that appropriate analyses can be performed at a later time.

0630 Hazards Protection for Space Suits and Spacecraft
J. J. Kosmo, F. S. Dawn
National Aeronautics and Space Administration, Houston, TX. Lyndon B. Johnson Space Center
Filed 30 Jun 88, patented 8 May 90 9p
PATENT-4 923 741 Available from Comm. of Patents
A flexible multi-layered covering article for protection against the hazards of exposure to the environment of outer space is disclosed. The covering includes an outer layer section comprising an outermost lamina of woven expanded tetrafluoroethylene yarns (Gore Tex) for protecting against abrasion and tearing, an underlying weave of meta-aramid yarns (Nomex) and para-aramid yarns (Kevlar) for particle impart protection, and electrostatic charge dissipation and control system incorporated therein, and a chemical contaminants control barrier applied as a coating. A middle section includes a succession of thermal insulating layers of polymeric thermoplastic or thermoforming material, each of which is coated with a metal deposit of high infra-red emissivity and low solar radiation absorption characteristics and separated from adjacent insulating layers by a low thermal conductance material. The covering further includes a radiation attenuating layer of a tungsten-loaded polymeric elastomer binder for protecting against bremsstrahlung radiation and an inner layer of rip-stop polyester material for abrasion protection. A chloroprene coating may be supplied the polyester-material for added micrometeroid protection. Securing means of low heat conductance material secures the multi-layers together as a laminar composite.

0631 Hollow Fiber Clinostat: Technical Abstract
P. H. Rhodes, T. Y. Miller, R. S. Snyder
National Aeronautics and Space Administration, Huntsville, AL. George C. Marshall Space Flight Center
Filed 28 Jul 89 13p
PAT-APPL-7-386 175 Available from NTIS: price code A03
A clinostat for simulating microgravity on cell systems carried in a fiber fixedly mounted in a rotatable culture vessel is disclosed. The clinostat is rotated horizontally along its longitudinal axis to simulate microgravity or vertically as a control response. Cells are injected into the fiber and the ends of the fiber are sealed and secured to spaced end pieces of a fiber holder assembly which consists of the end pieces, a hollow fiber, a culture vessel, and a tension spring with three alignment pins. The tension spring is positioned around the culture vessel with its ends abutting the end pieces for alignment of the spring. After the fiber is secured, the spring is decompressed to maintain tension on the fiber while it is being rotated. This assures that the fiber remains aligned along the axis of rotation. The fiber assembly is placed in the culture vessel and culture medium is added. The culture vessel is then inserted into the rotatable portion of the clinostat and subjected to rotate at selected rpms. The internal diameter of the hollow fiber determines the distance the cells are from the axis of rotation.

0632 Laser Diode Pumped, Erbium-Doped, Solid State Laser With High Slope Efficiency
L. Esterowitz, R. Allen, G. Kintz
Department of the Navy, Washington, DC
Filed 31 Oct 89 15p
PAT-APPL-7-429 426 Available from NTIS: price code N03
A laser and method for producing a laser emission at a wavelength of substantially 2.8 microns is disclosed. In a preferred embodiment of the invention, the laser comprises laser diode means for emitting a pump beam at a preselected wavelength; and a crystal having a preselected host material doped with a predeterminod percent concentration of erbium activator ions sufficient to produce a laser emission at substantially 2.8 microns at a slope efficiency of at least 5 percent, but preferrably 10 percent, when the crystal is pumped by the pump beam. It is well known that the human body is comprised of approximately 70% water, with various human tissues containing about 60% to 90% of water, and bone and cartilage containing about 30% to 40% of water. Since the 2.8 micron wavelength has a substantially maximum absorption in water, this 2.8 micron wavelength is the ideal wavelength to use for a large variety of medical laser applications on the human body. A 2.8 micron wavelength laser could be used for precise surgery in such exemplary applications as brain surgery, neurosurgery, eye surgery, plastic surgery, burn treatment and the removal of malignancies. Patent applications.

0633 Magnetization Transfer Contrast and Proton Relaxation and Use Thereof in Magnetic Resonance Imaging
R. Balban
National Institutes of Health, Bethesda, MD
Filed 14 Oct 87 30p
PAT-APPL-7-109 242 Available from NTIS: price code A03
A nuclear magnetic resonance method is provided for monitoring and imaging the exchange of magnetization between protons in free water and protons in a relatively immobilized pool of protons in a sample. The method provides a new form of contrast for nuclear magnetic resonance imaging of samples such as biological tissues, polymers, and geological samples.

0634 Method and Apparatus for Bio-Regenerative Life Support System
H. S. Cullingford
National Aeronautics and Space Administration, Houston, TX. Lyndon B. Johnson Space Center
Filed 11 Jul 89 34p
PAT-APPL-7-378 548 Available from NTIS: price code A03
A life support system is disclosed for human habitation (cabin) which has a bioregenerative capability through the use of a plant habitat (greenhouse) whereby oxygen-rich air from the greenhouse is processed and used in the cabin and carbon dioxide-rich air from the cabin is used in the greenhouse. Moisture from the air of both cabin and green-

house is processed and reused in both. Wash water from the cabin is processed and reused in the cabin as hygiene water, and urine from the cabin is processed and used in the greenhouse. Spent water from the greenhouse is processed and reused in the greenhouse. Portions of the processing cycles are separated between cabin and greenhouse in order to reduce to a minimum cross contamination of the two habitat systems. Other portions of the processing cycles are common to both cabin and greenhouse. The use of bioregenerative techniques permits a substantial reduction of the total consumables used by the life support system.

0635 Method and Apparatus for Characterizing Reflected Ultrasonic Pulses

W. T. Yost, J. H. Cantrell
National Aeronautics and Space Administration, Hampton, VA. Langley Research Center
Filed 17 Oct 89 32p
PAT-APPL-7-422 726 Available from NTIS: price code N03

The invention is a method of and apparatus for characterizing the amplitudes of a sequence of reflected pulses R1, R2, and R3 by converting them into corresponding electric signals E1, E2, and E3 to substantially the same value during each sequence thereby restoring the reflected pulses R1, R2, and R3 to their initial reflection values by timing means, an exponential generator, and a time gain compensator. Envelope and baseline reject circuits permit the display and accurate location of the time spaced sequence of electric signals having substantially the same amplitude on a measurement scale on a suitable video display or oscilloscope.

0636 Method and Device for Improved Use of Heart/Lung Machine

T. Kolobow
Department of Health and Human Services, Washington, DC
Filed 5 May 88 20p
PAT-APPL-7-190 637 Available from NTIS: price code N03

Long term closed chest partial and total cardiopulmonary bypass by peripheral cannulation for severe right and/or left ventricular failure is achieved by the use of a percutaneous coil positioned in the pulmonary artery across the pulmonary artery valve to decompress the left heart.

0637 Oxygen Breathing Apparatus Simulator Using Supplemental Oxygen

E. Swiatosz
Department of the Navy, Washington, DC
Filed 23 Jun 82, patented 18 Sep 84 4p
PATENT-4 471 774 Available from Comm. of Patents

The present invention relates to fire fighting trainers and in particular to the personal breathing apparatus used in such training. More particularly, the present invention relates to the canisters used to supply air to the breathing apparatus during such training. A training canister for use with a personal breathing apparatus supplements filtered air with oxygen supplied by an internal cylinder. The canister has an integral filter providing airflow to the breathing apparatus, and utilizes a miniature high pressure valve to release supplemental oxygen into the system from an oxygen cylinder charged to up to 2000 psi. The training canister simulates operational equipment in size, shape, integration to the personal breathing apparatus, and actuation. Patents.

0638 Rapidly Quantifying the Relative Distention of a Human Bladder

J. A. Companion, J. S. Heyman, B. A. Mineo, A. R. Cavalier, T. N. Blalock
National Aeronautics and Space Administration, Hampton, VA. Langley Research Center
Filed 10 Nov 87, patented 1 Aug 89 13p
PATENT-4 852 578 Available from Comm. of Patents

A device and method of rapidly quantifying the relative distention of the bladder in a human subject are disclosed. The ultrasonic transducer which is positioned on the subject in proximity to the bladder is excited by a pulser under the command of a microprocessor to launch an acoustic wave into the patient. This wave interacts with the bladder walls and is reflected back to the ultrasonic transducer, when it is received, amplified and processed by the receiver. The resulting signal is digitized by an analog-to-digital converter under the command of the microprocessor and is stored in the data memory. The software in the microprocessor determines the relative distention of the bladder as a function of the propagated ultrasonic energy; and based on programmed scientific measurements and individual, anatomical, and behavioral characteristics of the specific subject as contained in the program memory, sends out a signal to turn on any or all of the audible alarm, the visible alarm, the tactile alarm, and the remote wireless alarm.

0639 Safety Pipette and Adaptor Tip

J. Whelan
National Institutes of Health, Bethesda, MD
Filed 18 Dec 89 19p
PAT-APPL-7-451 689 Available from NTIS: price code N03

The invention provides a safety pipette, a safety pipette insert, and a pipette adaptor which are designed so that the user is prevented from mouth pipetting fluids. In order to utilize the present technology, a user must employ a standard pipetting device to withdraw fluids into a pipette.

0640 Scheiner-Principle Pocket Optometer for Self Evaluation and Bio-Feedback Accommodation Training

W. B. Cushman
Department of the Navy, Washington, DC
Filed 28 Feb 90 17p
PAT-APPL-7-486 323 Available from NTIS: price code N03

The present invention relates to optometers and particularly to a Scheiner-principle optometer apparatus, and method therefor, for measuring the resting state of accomodation, and for providing cognitive recognition of this accommodative state in order to facilitate bio-feedback training of that accommodative state. The need for precise lens accommodation to bring visual targets into sharp focus on the retina is far more urgent at night when contrast is very low, than in bright daylight. Unfortunately, it is at precisely this time that many individuals become myopic and further reduce the quality of an already poor visual image. Keywords: Patent applications.

0641 Scheiner-Principle Vernier Optometer

W. B. Cushman
Department of the Navy, Washington, DC
Filed 23 Jun 89 20p
PAT-APPL-7-370 521 Available from NTIS: price code N03

This patent application discloses a method and optometer apparatus for measuring the dark focus of accommodation.

In a preferred embodiment, the optometer apparatus includes: a pinhole aperture plate having first and second horizontally positioned apertures disposed on opposite sides of a first optical axis; first and second orthogonally-oriented polarizing filters respectively covering the first and second horizontally positioned apertures; a positive lens having an optical axis on the first optical axis and being positioned at a distance of approximately one focal length from the pinhole aperture plate; a lens system having an optical axis on the first optical axis; a slit aperture plate having a vertical slit and being disposed on the first optical axis and between the positive lens and the lens system; third and fourth vertically positioned polarizing filters selectively disposed adjacent to the slit aperture plate to divide the slit vertically, a monochromatic light source for propagating light along the first optical axis through the lens system; and movable means attached to the slit aperture plate, the lens system and the monochromatic light source for moving the slit aperture plate.

0642 Solid-State Photometer Circuit
A. V. Stiffey, D. L. Blank, G. I. Loeb
Department of the Navy, Washington, DC
Filed 24 Mar 86, patented 25 Aug 87 3p
PATENT-4 689 305 Available from Comm. of Patents
This patent discloses a stable, inexpensive and easily constructed photometer consisting of a commercial integrated photodetection assembly, complementary solid-state operational amplifiers and a solid-state power supply for use in the detection and quantification of low level light emissions from bioluminescence organisms and for the detection of the absence of bioluminescence. Means are provided for controlling the sensitivity of the system as well as providing for direct readout or integration of the detected signals where they are intermittent. Keywords: Dinoflagellates bioluminescence. Patents.

0643 Stand-Aid Invalid Wheelchair
R. K. Fogg, C. P. Staehli
Department of the Navy, Washington, DC
Filed 23 Oct 75, patented 18 Oct 77 13p
PATENT-4 054 319 Available from Comm. of Patents
A wheelchair is designed to enable an invalid to stand, sit or choose at will any intermediate position to perform useful work, and to move about in any of said positions. The wheelchair helps to fulfill the psychological and physiological needs of handicapped persons. The lifting and lowering operations are so arranged that practically no dislocation of the invalid's clothes occurs during the operations. The wheelchair has a minimum of physical encumbrances permitting the invalid to function near normally in the average living or working spaces. Keywords: Handicapped persons; Medical equipment/chairs; Patents.

0644 Universal Collector for Submandibular-Sublingual Saliva
R. Davis
Department of Health and Human Services, Washington, DC
Filed 14 Mar 90 16p
PAT-APPL-7-493 538 Available from NTIS: price code N03
The objects of the invention are: to provide a fluid sampling device which can be used to collect small samples of fluids in areas bounded by membranes; to provide for a device for sampling and collecting submandibular and sublingual salivas from a subject's mouth; to provide for a submandibular and sublingual saliva sampling and collecting device which is simple to use and highly reliable; to provide a method for sampling and collecting small volumes of fluid from areas bounded by membranes; and to provide a method for sampling and collecting submandibular and sublingual salivas from a subject's mouth.

MEDICINE, BIOLOGY, & HUMAN FACTORS: Pharmacology

0645 5-Aminocarbonyl-5H-Dibenzo(a,d)Cycloheptene-5,10-Imines for Treatment of Epilepsy and Cocaine Addiction
J. A. Monn, A. Thurkauf, S. Yamaguchi, M. A. Rogawski, K. C. Rice
National Institutes of Health, Bethesda, MD
Filed 9 May 89 15p
PAT-APPL-7-349 187 Available from NTIS: price code N03
The invention is in the field of clinical neurology and relates specifically to compounds, compositions and methods for treatment of patients with generalized epilepsy or partial (symptomatic) epilepsy. The invention also relates to compounds, compositions and methods of treatment for drug craving in patients addicted to cocaine.

0646 Acid Stable Purine Dideoxynucleosides Active against the Cytopathic Effects of Human Immunodeficiency Virus (Continuation in Part of Serial No. 039,402)
V. Marquez, J. Driscoll, C. K. H. Tseng
Department of Health and Human Services, Washington, DC
Filed 16 Feb 89 20p
PAT-APPL-7-313 056 Available from NTIS: price code A03
Purine nucleosides active against human immunodeficiency virus which are substituted at the 2'- position by a strong electronegative group such as fluorine are stable in an acid environment and thus can be used for oral administration.

0647 Acid Stable Pyrimidine Dideoxynucleosides Active against the Cytopathic Effects of Human Immunodeficiency Virus
V. Marquez, J. Driscoll, C. K. H. Tseng
Department of Health and Human Services, Washington, DC
Filed 19 Feb 89 19p
PAT-APPL-7-288 652 Available from NTIS: price code A03
Pyrimidine nucleosides active against human immunodeficiency virus which are substituted at the 2'-position by a strong electronegative group such as fluorine are stable in an acid environment and thus can be used for oral administration.

0648 Aerosol Preparation of Glutathione and a Method for Augmenting Glutathione Level in Lungs
R. Crystal
National Institutes of Health, Bethesda, MD
Filed 24 Nov 89 25p
PAT-APPL-7-441 521 Available from NTIS: price code N03
The object of the invention is to provide a novel, efficacious method of delivering GSH in the lungs. Other objects are to provide a substantially non-toxic, aerosol composition of GSH for direct administration to human lungs; and to provide a method of combatting pulmonary dysfunction, disor-

der or disease where an increased level of GSH is deemed beneficial by directly administering aerosol GSH to the lungs.

0649 Anti-Hypertensive Compositions of Secondary Amine-Nitric Oxide Adducts and Use Thereof
L. K. Keefer
National Institutes of Health, Bethesda, MD
Filed 15 Sep 89 13p
PAT-APPL-7-409 552 Available from NTIS: price code N03
The invention concerns anti-hypertensive compositions and a method of lowering blood pressure in mammals. The active component of the compositions includes sidechains composed of; straight chain and branched chain C1 - C12 alkyl groups and benzyl, with the proviso that no branch occur on the alpha carbon atom of the alkyl groups; or combined sidechains with the nitrogen atom they are bonded forming a pyrrolidino, piperidino, piperazino or morpholino group. The cationic species in the compound is a pharmaceutically acceptable cation, wherein x is the valence of the cation.

0650 Anti-Viral Therapy
J. J. Hooks, C. H. Evans, B. Detrick
National Institutes of Health, Bethesda, MD
Filed 11 May 90 19p
PAT-APPL-7-521 706 Available from NTIS: price code N03
The invention relates, in general to anti-viral therapy, and, in particular, to a method of inhibiting viral production which involves the use of the cytokine, leukoregulin. The objects of the invention are: to provide a method of inhibiting in an animal production of an infectious virus; and to provide a pharmaceutical composition suitable for use in the above method.

0651 Antihypertensive Compositions and Use Thereof
L. Keefer
National Cancer Inst., Bethesda, MD
Filed 18 Oct 89 18p
PAT-APPL-7-423 279 Available from NTIS: price code N03
The invention provides pharmaceutical compositions comprising: a compound of the formula J(NO-(N=O)a)bMc+x wherein J is an organic or inorganic moiety, M+x is a pharmaceutically acceptable cation, wherein x is the valence of the cation, a is 1 or 2, b and c are the smallest integers that result in a neutral compound, and wherein the compound decomposes under physiological conditions to release nitric oxide (NO); and a pharmaceutically acceptable carrier; with the proviso that the compound of formula I not be a salt of alanosine or dopastin. Another object of the invention is a method of treating cardiovascular disorders by lowering the blood pressure by administering a compound of formula I.

0652 Antiviral Compositions and Methods
H. Mitsuya, S. Broder
Department of Health and Human Services, Washington, DC
Filed 11 Aug 87, patented 29 Aug 89 11p
PATENT-4 861 759 Available from Comm. of Patents
Compositions containing 2',3'-dideoxyadenoine, 2',3'-dideoxyinosine, and dideoxyguanosine and their triphosphates for use in treating retroviral infections including acquired immune deficiency syndrome (AIDS) are disclosed with preferred methods of treatment which provide protection against cytopathic effects of human immunodeficiency virus

0653 Antiviral Compositions Containing Sulfoquinovosyl Glycerol Derivatives and Analogs Thereof and Methods for Using the Same
M. Boyd, J. Cardellina, K. Snader, K. Gustafson, G. Patterson
Department of Health and Human Services, Washington, DC
Filed 15 Aug 89 23p
PAT-APPL-7-393 780 Available from NTIS: price code N03
Antiviral compositions useful for inhibition of the cytopathic effects of the human immunodeficiency virus (HIV), which is implicated as a causitive agent of AIDS (Acquired Immune Deficiency Syndrome), include a new class of HIV-inhibitory compounds, the sulfonic acid-containing glycolipids. The pure compounds were active against HIV in cultured human lymphoblastoid CEM, MT-2, LDV-7 and C3-44 cell lines as indicated by the tetrazolium assay, as well as by correlative p24 viral protein and syncytia formation assays.

0654 Branched Alkyl Esters of 4-Bis(Chloroethyl)-Aminophenyl-Alkyl Carboxylic Acids for Treatment of Primary and Metastatic Tumors of the Lymphatic System, and of Cancers of the Breast and Ovaries
N. H. Greig, F. Ali-Osman, S. Genka, H. U. Shetty, T. T. Soncrant
National Institutes of Health, Bethesda, MD
Filed 9 Feb 90 24p
PAT-APPL-7-478 075 Available from NTIS: price code N03
Chlorambucil-tertiary butyl ester is a lipophilic anticancer alkylating agent for the chemotherapeutic treatment of tumors that develop or metastasize into tissue that are comprised of a high lipid content. Extensive previous studies have demonstrated that the agent appreciably enters and maintains high and therapeutic concentrations within the brain. As a consequence, the agent was patented for the treatment of brain tumors. Several other important organs are comprised of a high lipid content and frequently develop life-threatening tumors. These include primary (Hodgkins and Non-Hodgkins lymphomas) and metastatic tumors of the lymphatic system, and cancers of the breast and ovaries. Recent studies, included in the report, indicate that chlorambucil-tertiary butyl ester will be of clinical value in the chemotherapeutic treatment of these diseases.

0655 Chemical Differentiating Agents. Differentiation of HL-60 Cells by Hexamethylenebisacetamide (HMBA) Analogs
A. Haces, T. R. Breitman, J. S. Driscoll
Department of Health and Human Services, Washington, DC
Filed 16 Jun 87 43p
PAT-APPL-7-062 422 Available from NTIS: price code N03
Hexamethylenebisacetamide (HMBA) is an agent in clinical trial which induces differentiation of certain types of tumor cells to non-malignant phenotypes. In an attempt to discover a more potent compound, a number of bis-functionalized amides, imides and hydrazine derivatives of HMBA were prepared and evaluated in vitro using the HL-60 human promyelocytic leukemia cell line. Among the compounds evaluated, the 5,5-dimethylhydantoin derivative is almost ten times more potent than HMBA in inducing differentiation. The bis-imide, diacetyl HMBA, is both more potent and ef-

fective than its parent compound. Six of the 16 compounds evaluated cause at least 20% differentiation. An inverse relationship between the degree of differentiation and the percentage of viable cells is described for HMBA and its analogs.

0656 Endogenous, Suramin-Induced, Sulfated Glycosamino-Glycans as Anti-Cancer Agents in Humans
R. V. La Rocca, M. R. Cooper, C. A. Stein, C. E. Myers
National Institutes of Health, Bethesda, MD
Filed 5 May 90 27p
PAT-APPL-7-488 105 Available from NTIS: price code A03
The objects of the present invention are: to provide for elevating levels of sulfated glycosaminoglycans (GAGs) in human patients having cancers susceptible to the anti-proliferative effect of such GAGs; to provide for a method of isolating sulfated GAGs from a human patient treated with suramin; to provide a method for treating cancers, by administering to a patient effective amounts of purified human endogenous sulfated GAGs for treating cancers, susceptible to treatment therewith; and to provide pharmaceutical compositions for administering such GAGs to a patient by injection.

0657 Functionalized Complexand
M. W. Brechbiel, O. A. Gansow
National Institutes of Health, Bethesda, MD
Filed 26 Mar 90 22p
PAT-APPL-7-498 320 Available from NTIS: price code N03
The invention relates to macrocyclic chelates and methods of use. Specifically, the invention relates to a substituted 1,4,7,10-tetraazacyclododecane triacetic acid wherein the three triacetic acids are linked at three of the nitrogens of the macrocycle, and a hydrogen is attached to the fourth nitrogen of the macrocycle. The chelate exists as a mixture of the four possible structures (or isomers). The invention also relates to the various uses of these particular chelating agents in medicine.

0658 IGE FC Directed Delivery System
M. A. Kaliner, H. Boltansky
Department of Health and Human Services, Washington, DC
Filed 22 Jul 86, patented 20 Feb 90 1p
PATENT-4 902 495 Available from Comm. of Patents
An immunotoxin comprising a conjugate of a toxin with immunoglobulin E or a part thereof and a method delivering the same to a target site is described. Mast cell related abnormalities can be detected by the immunotoxin of the present invention.

0659 Immunotoxins for Treatment of Intracranial Lesions and as Adjunct to Chemotherapy
V. Johnson, R. J. Youle
Department of Health and Human Services, Washington, DC
Filed 1 Sep 89 44p
PAT-APPL-7-401 412 Available from NTIS: price code N03
The invention provides an improved anti-cancer therapy which is particularly efficacious against several malignancies including leptomeningeal carcinomatosis, leptomeningeal leukemia, and CSF-borne tumors. The compositions and methods taught herein provide means of treating both primary and metastatic lesions of the central nervous system. The diphtheria conjugate using cell recognition moieties such as transferrin or anti-transferrin receptor monoclonal antibodies provide uniquely useful agents. The use of binding or cell recognition moieties consisting of monoclonal antibodies against the human transferrin receptor linked to a mutant form of diphtherial toxin, CRM 107, in which the binding function of the toxin has been inactivated by point mutations at positions 390 and 525 of the toxin B chain is a preferred embodiment taught herein.

0660 Improved Toxin for Construction of Immunotoxins
I. Pastan
National Institutes of Health, Bethesda, MD
Filed 21 Dec 89 27p
PAT-APPL-7-454 162 Available from NTIS: price code N03
The application relates to the production of improved toxins which are useful in constructing more effective immunotoxins from the production of recombinant proteins from modified Pseudomonas exotoxin (PE) gene fused with DNA sequences encoding a recognition protein for which a specific receptor exists on the cells. Particularly, the invention provides an altered PE molecule, designated herein as Lys-PE40, that can be easily conjugated to an antibody with effective cytotoxicity toward target cells.

0661 Inhibition of Human Immunodeficiency Virus -1 Infectivity in Human Cells
S. Oroszlan, W. Tsai, P. L. Nara, H. Kung
National Institutes of Health, Bethesda, MD
Filed 26 Jan 90 45p
PAT-APPL-7-470 692 Available from NTIS: price code N03
The invention is concerned with methods of inhibiting the infectivity of Human Immunodeficiency Virus-1 (HIV-1) in infected human cells. The invention is further concerned with methods of inhibiting the infectivity of HIV-1 in the cells of an infected patient; the patient infected with HIV-1 may additionally have Acquired Immunodeficiency Syndrome (AIDS). Specifically, the present invention provides for a method of inhibiting HIV-1 infectivity in chronically infected human cells, comprising: contacting HIV-1 infected human cells with an effective HIV-1 replication inhibiting amount of a quinolinyl and a cridinyl compound.

0662 Inhibition of Malignant Cells Having GM1 Ganglioside Sites by Administration of Cholera Toxin
J. Viallet, E. A. Sausville, J. Minna
National Cancer Inst., Bethesda, MD
Filed 20 Nov 89 23p
PAT-APPL-7-438 643 Available from NTIS: price code N03
The invention relates to treatment of certain malignancies characterized by presence of GM1 ganglioside on the cell membrane. While it had previously been known that growth of some malignant cells could be inhibited by exposure to cholera toxin (CT), the use of that toxin as a therapeutic agent was not previously considered as a practical approach to treatment. Part of the difficulty arose from lack of means of predicting which malignancies would respond to such treatment. The instant invention provides means of identifying malignancies that would respond to treatment with cholera toxin along with dosage requirements and means of administration of the active agent.

0663 Macrocyclic Chelates and Methods of Use Thereof
O. Garsow, M. Brechbiel, M. Magerstadt
Department of Health and Human Services, Washington, DC
Filed 25 Nov 87 19p
PAT-APPL-7-198 538 Available from NTIS: price code N03
The invention relates to macrocyclic chelates, in particular, a group capable of being used for drug delivery purposes. The group studied includes 2-substituted 1, 4, 7, 10-tetraazacyclododecane -N, N', N'', N'''-tetraacetic acid and 2-substituted 1, 4, 7, 10-tetraazacyclododecane. Substituents discussed include bismuth, lead, yttrium, cadmium, mercury, aluminum, thallium, strontium, and the lanthanides.

Metalloproteinase Peptides: Role in Diagnosis and Therapy
See 0748

Method for the Treatment of Cancer by Use of the Copper Complex of S-(Methylthio)-DL-Homocysteine
See 0757

0664 Method of Preventing Graft Rejection in Solid Organ Transplantation
R. A. Hess, R. Blaese, C. Stone
National Institutes of Health, Bethesda, MD
Filed 28 Jul 89 20p
PAT-APPL-7-386 114 Available from NTIS: price code N03
A method is disclosed for preventing graft rejection of transplanted solid organs, in mammal recipients thereof, by administering an effective graft rejection preventative amount of succinylacetone to said mammals.

0665 Method of Treating Diseases Associated with Elevated Levels of Interleukin 1
G. Rosenthal
National Institutes of Health, Bethesda, MD
Filed 10 Apr 90 32p
PAT-APPL-7-506 613 Available from NTIS: price code N03
The invention relates to a method for inhibiting the release of interleukin 1 (IL-1) from IL-1 producing cells. More specifically, the invention relates to the treatment of diseases associated with elevated levels of IL-1, comprising administering to warm blooded animals, including humans, in need of such treatment, a therapeutically effective amount of an aromatic diamidine.

0666 Method of Treating Ocular Diseases by Periocular Administration of Cyclosporine A or G
R. B. Nussenblatt, A. G. Palestine
National Eye Inst., Bethesda, MD
Filed 20 Dec 89 14p
PAT-APPL-7-453 793 Available from NTIS: price code N03
An object of the invention is to provide a method for the treatment of various ocular diseases. Another object of the present invention are to provide a method for effectively treating ocular diseases while lowering the risks of undesirable physiological problems, such as nephrotoxicity, associated with conventional treatments, such as those using cyclosporine A; to provide a method for the treatment of ocular diseases by administration of cyclosporine A or G through periocular injection into the patient; to provide an effective method for the treatment of ocular diseases including endogenous uveitis, Behcet's Disease, corneal transplantation, vernal keratoconjunctivitis, ligneous keratoconjunctivitis, dry eye syndrome, anterior uveitis and onchocerciasis.

0667 New Anti-HIV (Human Immunodeficiency Virus) Compounds Belonging to Aurintricarboxylic Acid
R. Haugwitz
National Institutes of Health, Bethesda, MD
Filed 3 Nov 89 51p
PAT-APPL-7-431 568 Available from NTIS: price code N03
An object of the invention is to provide a substantially pure monomer of ATA. Another object of the invention is to prepare structural analogs of the monomer of ATA, including a variety of substituted di- and tri-phenylmethanes, as well as to synthesize homogeneous, structurally defined polymers related to ATA and to prepare structural analogs of polymeric ATA; to fractionate polymeric ATA and polymeric ATA analogs on the basis of molecular weight and to identify the anti-HIV activity and cytotoxicity of the various fractions; and to manufacture compounds having greater potency and less cytotoxicity than ATA so as to design drugs that would be useful for the treatment of AIDS and other viral diseases.

0668 New Method for Treating Immunodeficiency or Neutropenia
K. Matsushima
National Institutes of Health, Bethesda, MD
Filed 2 Feb 90 23p
PAT-APPL-7-474 497 Available from NTIS: price code N03
The objects of the present invention are to demonstrate neutrophil chemotactic activity of MGSF, and to provide a new method for stimulating increased neutrophil number and activity to combat diseases caused by the condition of immunodeficiency resulting from or associated with neutrophil dysfunction or neutropenia.

0669 Nitroxides as Protectors against Oxidative Stress
J. B. Mitchell, A. Samuni, W. G. DeGraff, S. Hahn
National Institutes of Health, Bethesda, MD
Filed 27 Feb 90 38p
PAT-APPL-7-494 532 Available from NTIS: price code N03
The objects of the invention are to overcome the problems associated with the use of impermeable enzymatic detoxifying agents such as superoxide dismutase and catalase to protect living tissues from the deleterious effects of toxic products generated during oxygen metabolism. This is accomplished by providing a pharmaceutical composition containing the nitroxide compounds by any means, and methods for using the same as metal independent, low molecular weight antioxidant for use as protectants against oxidative stress.

0670 Novel Antioxidant in Humans, Composition Thereof and Method of Treating Oxidant Related Disorders
D. B. Peden, M. A. Kaliner
National Institutes of Health, Bethesda, MD
Filed 31 Jan 90 66p
PAT-APPL-7-472 855 Available from NTIS: price code N03
The invention is directed to a purified compound useful as an antioxidant. The purified compound is preferably at least 50% pure, more preferably at least 90% pure, and most preferably at least 95% pure. The compound should be

free from toxic substances or substances which would inhibit the pharmaceutical activity of the compound. When the compound is isolated from nasal mucosal secretions, impurities such as albumin, exogenous proteins and natural oxidants should be substantially completely removed. The invention is further directed to a method for treating oxidant associated respiratory airway disorders in a patient, which comprises administering an effective amount of the above-described compound or composition to a patient for inhibiting or reversing oxidant associated respiratory airway disorders.

0671 Partial Agonists of the Strychnine Insensitive Glycine Modulatory Site of the N-Methyl-D-Aspartate Receptor Complex as Neuropsychopharmacological Agents
P. Skolnick, A. Lewin, J. C. Marvizon, J. Monn, K. Rice
National Institutes of Health, Bethesda, MD
Filed 8 Aug 89 35p
PAT-APPL-7-390 745 Available from NTIS: price code N03
The present invention provides for a method for treating a neuropsychopharmacological disorder in a patient, wherein the neuropsychopharmacological disorder treated is associated with or resulting from excessive activation of the N-methyl-aspartate receptor complex, said method comprising: administering to said patient possessing a neuropsychopharmacological disorder an effective amount of a compound which possesses partial agonist properties for the strychnine insensitive glycine modulatory site of the N-methyl-D-aspartate receptor complex. 1-Aminocyclopropanecarboxylic Acid (ACPC) has been shown to be potent and selective partial agonist of the strychnine insensitive glycine binding site of the N-methyl-D-aspartate (NMDA) receptor complex

Peptide Derivatives of Cytochrome b (sub 558) and Their Use as Medicaments
See 0786

0672 Phenylcycloalkylamine Compounds as Antiepileptics
M. A. Rogowski, K. C. Rice, A. E. Jacobson, A. Thurkauf, B. de Costa
National Institutes of Health, Bethesda, MD
Filed 15 Sep 89 38p
PAT-APPL-7-409 557 Available from NTIS: price code N03
The invention concerns an improvement in the treatment of epilepsy based on a phenyl group with possible constituents being: R1, R2 and R4 which are independently H or C1 - C4 alkyl; and R3 is H, C1 - C4 alkyl, C1 - C4 alkoxy, C1 - C4 alkylthio, phenyl, phenoxy, hydroxy, thiol or halogen, wherein the alkyl, alkoxy and alkylthio R3 groups can be substituted by one of more halogen atoms; or geometrical isomers, stereoisomers and mixtures of stereoisomers thereof; or pharmaceutically acceptable salts thereof.

0673 Pyrimidine and Purine 1,2-Butadiene-4-OLS as Anti-Tetroviral Agents
S. Broder, S. Hayashi, H. Mitsuya, J. Zemlicka, S. Phadtare
Department of Health and Human Services, Washington, DC
Filed 31 Dec 87, patented 19 Jun 90 2p
PATENT-4 935 427 Available from Comm. of Patents
Compounds which are active against retroviruses include butadienol structures containing purine or pyrimidine heterocyclic ring preferably selected from the group consisting of cytosine, 5-halo substituted cytosine, 5-alkyl substituted cytosine, 6-aminopurine, 2,6-diaminopurine, 6-hydroxypurine, 2-amino-6-hydroxypurine, 3-deazapurines, 7-deazapurines, 8-azapurines, and 6-azapyrimidines.

Resiniferatoxin and Analogues Thereof to Cause Sensory Afferent C-Fiber and Thermoregulatory Desensitization
See 0803

0674 Slowly Dissociating (Tight Binding) Dopamine, Serotonin or Norepinephrine Reuptake Inhibitors as Cocaine, Amphetamine and Phencyclidine Antagonists
R. B. Rothman, A. Pert, K. C. Rice, N. Greig, A. Reid
National Institutes of Health, Bethesda, MD
Filed 3 Aug 89 16p
PAT-APPL-7-388 866 Available from NTIS: price code N03
Although drug treatments for cocaine craving are available, there are currently no drugs available which will effectively block the acute effects of cocaine. The authors have discovered that (1-(2-(BIS(4-fluorophenyl)methoxy)ethyl)-4-(3-phenylpropyl) piperazine), known as GBR12909 acts as a cocaine antagonist in animal models of cocaine abuse. The administration of the compound, or compounds which work via the same mechanism, for the treatment of cocaine, amphetamine and PCP abuse in humans was not previously known. For the purposes of the invention, the term 'tight binding' is extended to drugs which bind tightly either as a result of strong noncovalent bonds, or as a result of formation of covalent bonds, to the reuptake complex. GBR12909 is known to be a high affinity blocker of DA reuptake. The data reported demonstrates that GBR12909 binds tightly to the DA reuptake complex after in vivo administration, and can be used to antagonize the effects of cocaine to elevate ECDA levels, a bioassay thought to be highly relevant to the euphoric and addictive effects of cocaine.

0675 Stabilized Nitric Oxide - Primary Amine Complexes Useful as Cardiovascular Agents
L. K. Keefer
Department of Health and Human Services, Washington, DC
Filed 28 Feb 89, patented 4 Sep 90 1p
PATENT-4 954 526 Available from Comm. of Patents
A method of treating cardiovascular disorders in a mammal, by administering to said mammal an effective amount of a compound of the formula: (R-N(H)N(NO)O-L(sub y)X) wherein R is loweralkyl, aryl, arylalkyl, or cycloalkyl, any of which R groups may be optionally substituted by one to three substituents selected from the group consisting of: halo, hydroxyl, alkoxy, amino, amido, formyl, carboxyl, or nitro; and wherein X is a pharmaceutically acceptable cation, a pharmaceutically acceptable metal center, or a pharmaceutically acceptable organic group selected from loweralkyl, acyl or amido, and Y is 1 to 3 consistent with the valence of X. Pharmaceutical compositions containing the compounds are also provided.

Starch Encapsulation of Biologically Active Agents by a Continuous Process
See 0032

0676 Sulfur-Containing Xanthine Derivatives as Adenosin Antagonists
K. A. Jacobson, W. Pfleiderer, J. W. Daly, J. L. Neumeyer
National Inst. of Diabetes and Digestive and Kidney Diseases, Bethesda, MD
Filed 19 Apr 89 33p
PAT-APPL-7-340 351 Available from NTIS: price code N03
The invention provides for means of synthesis compounds with increasingly selective activity as adenosine receptor antagonists in xanthine drugs. Xanthines and thioxanthines were synthesized and further derivatized by forming an imidazole ring in the compound. A variety of derivatives were formed from this step and their selectivites for A1 and A2 adenosine receptors were determined.

0677 Suramin and Active Analogues Thereof in the Treatment of Hypercalcemia
M. M. Walther
National Institutes of Health, Bethesda, MD
Filed 29 Mar 90 29p
PAT-APPL-7-500 913 Available from NTIS: price code N03
The objects of the invention are: to provide an advantageous method for the treatment of hypercalcemia, wherein more than short lived effectiveness in treating hypercalcemia is achieved; and to provide an advantageous method for treating hypercalcemia, so that the occurrence of arrhythmias, altered renal functions and mental states, and the like, which can result from hypercalcemia are lessened and/or prevented. Methods are provided for treating hypercalcemia in a patient by administration to a patient in need thereof, an effective amount of suramin, or an active analog, or pharmaceutically acceptable salts, for the treatment of hypercalcemia.

0678 Target-Specific, Cytotoxic, Recombinant Pseudomonas Exotoxin
I. Pastan
National Institutes of Health, Bethesda, MD
Filed 2 Jan 90 32p
PAT-APPL-7-459 635 Available from NTIS: price code N03
An object of the invention is to determine the role of the carboxyl terminus of the PE molecule in its cytotoxic action. Other objects of the present invention are to identify specific regions at the carboxyl terminus of the PE molecule for the insertion of recognition molecules for selective killing of target cells; to provide an improved, target-specific, cytotoxic recombinant PE molecule, wherein the improvement comprises the insertion of target-specific recognition molecule at least in domain III at the carboxyl terminus of the PE molecule; to modify the carboxyl end of the PE to increase the potency of the chimeric toxin; and to make cytotoxic PE with two recognition molecules (target ligands) wherein either the same recognition molecule is placed at two different termini.

0679 Treatment for Cocaine Addiction
S. R. B. Weiss, R. M. Post, T. G. Aigner
National Institutes of Health, Bethesda, MD
Filed 1 Mar 89, patented 17 Jul 90 2p
PATENT-4 942 182 Available from Comm. of Patents
Chronic oral administration of carbamazepine may be used to block reinforcing effects and toxic effects of cocaine. It is preferred that the subject be essentially 'clean' of codeine at the time the treatment with carbamazepine is commenced.

0680 Use of Arsenite to Reversibly Block Steroid Binding to Glucocorticoid Receptors in the Presence of Other Steroid Receptors
S. S. Simons
National Institutes of Health, Bethesda, MD
Filed 23 Jan 90 32p
PAT-APPL-7-468 929 Available from NTIS: price code N03
The invention is directed to a method for selectively blocking glucocorticoid receptors, which comprises contacting an effective glucocorticoid receptor blocking amount of arsenite or MMTS with a sample containing said glucocorticoid receptors. The invention is also directed to a method of selectively eliminating in a sample the binding of (3H)- steroids to glucocorticoid receptors in the presence of other steroid receptors. More particularly, the invention is directed to a method for assaying for progesterone receptors in breast cancer tissue, which comprises contacting a breast cancer tissue sample with an effective amount of arsenite or MMTS to effectively block glucocorticoid receptors present in the tissue sample and then assaying for the presence of progesterone receptors by any conventional means in the breast cancer tissue sample.

0681 Water Soluble, Antineoplastic Derivatives of Taxol
R. D. Haugwitz, L. Zalkow, J. Glinski, M. Suffness, H. M. Deutsch
Department of Health and Human Services, Washington, DC
Filed 7 Mar 88, patented 17 Jul 90 2p
PATENT-4 942 184 Available from Comm. of Patents
Antineoplastic, water soluble, taxol derivatives and methods for preparing the same are described.

0682 Water Soluble Products of Camptothecin
R. Vishnvvajjala, A. Garzon-Aburbey
Department of Health and Human Services, Washington, DC
Filed 6 Oct 87 21p
PAT-APPL-7-104 894 Available from NTIS: price code N03
The object of the invention is to improve upon results of past use of camptothecin by converting the drug to a water-soluble form. Further, an attempt is made to provide an improved method of treating certain types of cancer using camptothecin and its analogs, as well as with prodrugs developed in the invention.

0683 Water Soluble Products of Camptothecin
B. R. Vishnuvaijala, A. Garzon-Aburbeh
Department of Health and Human Services, Washington, DC
Filed 6 Oct 87, patented 24 Jul 90 2p
PATENT-4 943 579 Available from Comm. of Patents
Water-soluble derivatives of camptothecin have been determined to be composed of aryl and nitrogen- and oxygen-containing heterocycles. The derivatives also contain two ketone linkages and sidechains varying in composition.

MEDICINE, BIOLOGY, & HUMAN FACTORS: Other

5-Aminocarbonyl-5H-Dibenzo(a,d)Cyclohepten-5,10-Imines for Treatment of Epilepsy and Cocaine Addiction
See 0645

Acid Stable Purine Dideoxynucleosides Active against the Cytopathic Effects of Human Immunodeficiency Virus (Continuation in Part of Serial No. 039,402)
See 0646

Acid Stable Pyrimidine Dideoxynucleosides Active against the Cytopathic Effects of Human Immunodeficiency Virus
See 0647

0684 ACYL Carrier Protein-I/Protein-A Gene Fusion, Products and Methods
P. D. Beremand, D. J. Guerra
Agricultural Research Service, Washington, DC
Filed 9 Mar 90 27p
PAT-APPL-7-494 004 Available from NTIS: price code N03
The objects of the invention are to provide a hybrid protein comprising ACP and the Fc-binding portion of staphytococcal protein A; to provide recombinant DNA molecules comprising genes encoding for the hybrid protein; and to provide methods for affinity purification of enzymes involved in fatty acid biosynthesis.

0685 Adherent, Autoencapsulating Spray Formulations of Biocontrol Agents
B. S. Shasha, M. R. McGuire
Department of Agriculture, Washington, DC
Filed 3 Aug 89 21p
PAT-APPL-7-389 090 Available from NTIS: price code N03
Sprayable, starch-based formulations for autoencapsulating biological control agents, such as pathogenic bacteria and viruses, incorporate a sugary material to promote adherence of the encapsulated agent to treated foliage. The autoencapsulated pathogens are characterized by high survivability and are useful in controlling insects and other pest species.

0686 Adsorption System for Scavenging Anesthetic Agents from Waste Gas Released during Surgical Activity
J. Burkhart
National Institutes of Health, Bethesda, MD
Filed 24 May 90 24p
PAT-APPL-7-528 080 Available from NTIS: price code A03
The patent application relates to preventing release of gases or vaporized anesthetic substances into the ambient atmosphere in facilities where such substances are used. The invention will prevent chronic exposures to these agents that have been linked to liver and kidney diseases, CNS effects, spontaneous abortions in females, congenital abnormalities and even cancer.

0687 Adventitious Citrus Juice Vesicles from Pre-Existing Juice Vesicles
B. Tisserat
Department of Agriculture, Washington, DC
Filed 3 Aug 89 10p
PAT-APPL-7-389 194 Available from NTIS: price code A02
The invention comprises adventitious citrus juice vesicles having the unique characteristic that they branch out of pre-existing citrus juice vesicles. This is in contrast to tree-produced citrus juice vesicles which arise from the endocarp of the citrus fruit. The adventitious citrus juice vesicles optionally have the additional characteristics: they have the ability to produce additional adventitious citrus juice vesicles through branching and they are generally elliptical in shape. To obtain the novel juice vesicles, citrus juice vesicles from immature citrus fruit are cultured on a medium comprising an effective amount of a growth regulator, sugar, inorganic salts, and vitamins. An important feature is that only minimal callusing occurs.

Aerosol Preparation of Glutathione and a Method for Augmenting Glutathione Level in Lungs
See 0648

0688 Aggregation Pheromones of the Driedfruit Beetle, 'Carpophilus hemipterus'
R. J. Bartelt, P. F. Dowd
Agricultural Research Service, Washington, DC
Filed 25 Nov 88 32p
PAT-APPL-7-275 863 Available from NTIS: price code N03
The object of the invention is to describe the isolation and synthesis of the hydrocarbon components of the aggregation pheromone. Another object of the invention is to teach an improved method of attracting insects by the combined use of aggregation pheromones and food volatiles.

0689 Aggregation Pheromones of the Nitidulid Beetles 'Carpophilus hemipterus', 'Carpophilus lugubris' and 'Carpophilus freemani'
R. J. Bartelt, P. F. Dowd
Agricultural Research Service, Washington, DC
Filed 31 Jul 89 59p
PAT-APPL-7-387 555 Available from NTIS: price code N03
It is an object of the invention to describe the isolation and synthesis of the hydrocarbon components of the aggregation pheromones. Another object of the invention is to teach an improved method of attracting insects by the combined use of aggregation pheromones and food volatiles.

0690 Anti-Platelet Monoclonal Antibody
H. Gralnick
National Institutes of Health, Bethesda, MD
Filed 3 Nov 89 22p
PAT-APPL-7-432 126 Available from NTIS: price code N03
The invention refers to the production of monoclonal antibody 5G8 which has the following properties: it belongs to subclass IgG1; it binds to about 11,000 sites per platelet with a platelet surface protein of about 88kD in reduced or nonreduced form; it induces spontaneous platelet aggregation in the presence of plasma proteins causing release of internal platelet organelles and formation of large platelet aggregates; the MAb specifically recognizes glycoprotein IV (GPIV) and modulates platelet aggregation by binding to an epitope on GPIV and does not recognize GP IIb/IIIa complex; and platelet aggregation induced by this MAb is calcium dependent, but does not require magnesium and is not affected by aspirin treatment of platelets or by released ADP, nor other agonists are required for aggregation reaction to take place.

0691 Antigen and Immunoassay for Human Immunodeficiency Virus Type 2 (HIV-2)
T. S. Papas, M. Zuber, K. P. Samuel
Department of Health and Human Services, Washington, DC
Filed 14 Sep 89 53p
PAT-APPL-7-407 317 Available from NTIS: price code N03
Five unique recombinant polypeptides, each encoded by DNA segments representing most of the HIV-2 (NIH-Z

strain) env gene, were produced at relatively high-levels (5% of total cell protein) as cII-fusion products in Escherichia coli. These recombinant polypeptides were characterized serologically by the Western blot assay against a panel of HIV-2 and HIV-1 antibody positive sera, and with normal human sera (HIV-1 and HIV-2 antibody negative). Only those polypeptides from the N-terminal region of the transmembrane protein gp35 (amino acids 537 to 707) were immunoreactive. Three polypeptides (921, 996 and 997), each encoding this region of the HIV-2 gp35 reacted strongly and specifically with antibodies in sera from HIV-2 positive individuals, but not with HIV-1 positive or normal human sera. Thus, the N-terminal region of the HIV-2 gp35 contains a highly antigenic determinant which is strongly immunogenic in HIV-2 infected individuals. The gp35 recombinant env polypeptides may be used in diagnostic assays to specifically differentiate between HIV-2 and HIV-1 infections.

0692 Antigenic Proteins of Borrelia burgdorferi
W. Simpson, T. Schwan
Department of Health and Human Services, Washington, DC
Filed 5 Mar 90 30p
PAT-APPL-7-487 716 Available from NTIS: price code A03
The present invention relates to antigenic Borrelia burgdorferi proteins and their encoding DNA. In particular, the present invention relates to a 39 kilodalton (kDa) Borrelia burgdorferi protein which reacts with Lyme borreliosis serum and a 28 kDa Borrelia burgdorferi protein which reacts with Lyme borreliosis serum.

0693 Antigenic Proteins of Plasmodium
A. P. Waters, T. F. McCutchan
National Institutes of Health, Bethesda, MD
Filed 22 Feb 90 30p
PAT-APPL-7-483 516 Available from NTIS: price code N03
The object of the invention is to provide merozoite antigen proteins of simian or simian-like species of Plasmodium useful use as vaccines to provide protection against malaria in humans and animals.

Antihypertensive Compositions and Use Thereof
See 0651

Antiviral Compositions Containing Sulfoquinovosyl Glycerol Derivatives and Analogs Thereof and Methods for Using the Same
See 0653

0694 Apparatus for Hyperthermia Treatment of Cancer
J. Delanney
National Cancer Inst., Bethesda, MD
Filed 22 Nov 89 37p
PAT-APPL-7-439 661 Available from NTIS: price code N03
The invention relates to an apparatus for hyperthermia treatment which comprises a combination hyperthermia unit/MRI probe. Moreover, the invention also relates to an MRI apparatus which utilizes the combination hyperthermia unit/MRI probe disclosed herein. The apparatus is useful for the treatment of e.g., cancer usually as an adjunct to chemotherapy, and/or radiotherapy.

Array-Type Multiple Cell Injector
See 0628

Bifunctional DTPA-Type Ligand
See 0065

0695 Bio-Reactor Chamber
J. A. Chandler
National Aeronautics and Space Administration, Houston, TX. Lyndon B. Johnson Space Center
Filed 20 Aug 87, patented 13 Jun 89 9p
PATENT-4 839 046 Available from Comm. of Patents
A bioreactor for cell culture is disclosed which provides for the introduction of fresh medium without excessive turbulent action. The fresh medium enters the bioreactor through a filter with a backwash action which prevents the cells from settling on the filter. The bioreactor is sealed and depleted medium is forced out of the container as fresh medium is added.

Biocontrol of Grey-Mold in Pome Fruits Using 'Acremonium breve'
See 0004

0696 Biocontrol of Grey-Mold in Pome Fruits Using 'Acremonium breve'
W. J. Janisiewicz
Agricultural Research Service, Washington, DC
Filed 24 Feb 88, patented 21 Aug 90 1p
PATENT-4 950 472 Available from Comm. of Patents
A process for biologically controlling the postharvest disease, grey-mold, in pome fruits using a strain of Acremonium breve having the identifying characteristics of NRRL 18307. The organism is isolated from apples leaves and is applied to the fruits in an aqueous suspension using conventional techniques. The organism of the invention maybe used in combination with other biocontrol agents to simultaneously control more than one postharvest disease affecting the fruit. Also disclosed is a biologically pure culture of Acremonium breve, NRRL 18307.

Biological Control of Postharvest Rots in Fruits Using Pichia Guilliermondii (anamorph 'Candida guilliermondii')
See 0007

0697 cDNA and Protein Sequences of Human Bone Matrix Proteins
J. Termine
National Institutes of Health, Bethesda, MD
Filed 3 Nov 89 28p
PAT-APPL-7-432 044 Available from NTIS: price code N03
The invention relates generally to providing cDNA sequences of proteins. More particularly, the present invention relates to providing cDNA sequences as well as sense and anti-sense RNA and DNA sequences and the deduced amino acid sequences of a plurality of human bone matrix proteins, specific antisera and various applications thereof.

0698 cDNA Encoding the Long Isoform of the D2 Dopamine Receptor
D. R. Sibley, F. J. Monsma, L. D. McVittie, L. C. Mahan
National Institutes of Health, Bethesda, MD
Filed 1 Nov 89 21p
PAT-APPL-7-430 049 Available from NTIS: price code N03
The invention relates to a DNA segment encoding a long isoform of a mammalian D2 dopamine receptor having a sequence of 29 amino acids that is absent in the known isoform of this receptor. The 'long' isoform is the predominant species in mammalian tissues that are populated by D2 dopamine receptors. In a principal embodiment, a recombinant DNA molecule comprising cDNA clone of the rat

long isoform of this receptor and an expression vector is used to transfect eukaryotic cells which results in expression of this receptor on those cells. According to the present invention, receptors of this isoform, either in isolation or incorporated in cell membranes, are used for screening and developing drugs for selective activity on the dopamine receptor long isoform.

0699 Cell Attachment Peptides Derived from Amyloid P Component
S. Dhawan, F. A. Robey
National Inst. of Dental Research, Bethesda, MD
Filed 30 Aug 89 23p
PAT-APPL-7-400 870 Available from NTIS: price code N03
The present invention is directed to a human serum amyloid P component peptide sequence having 12 amino acid residues and having the sequence identified as Glu-Lys-Pro-Leu-Gln-Asn-Phe-Thr-Leu-Cys-Phe-Arg. The invention is also directed to fragments of the above peptide. Two fragments useful in the present invention have the sequence Phe-Thr-Leu-Cys-Phe-Arg and Leu-Cys-Phe-Arg. The above peptides are useful for attaching cells to substrates such as ceramics, tissue culture, dishes, polymers or enamels and thus are useful as research tools for studying particular cells. The above peptides are also useful in vivo as artificial organ replacements which attach surrounding natural cells.

Chemical Differentiating Agents. Differentiation of HL-60 Cells by Hexamethylenebisacetamide (HMBA) Analogs
See 0655

0700 Circumferential Pressure Probe
H. K. Holmes, T. C. Moore, A. J. Fantl
National Aeronautics and Space Administration, Hampton, VA. Langley Research Center
Filed 23 Sep 88, patented 17 Oct 89 7p
PATENT-4 873 990 Available from Comm. of Patents
A probe for measuring circumferential pressure inside a body cavity is disclosed. In the preferred embodiment, a urodynamic pressure measurement probe for evaluating human urinary sphincter function is disclosed. Along the length of the probe are disposed a multiplicity of deformable wall sensors which typically comprise support tube sections with flexible side wall areas. These are arranged along the length of the probe in two areas, one just proximal to the tip for the sensing of fluid pressure inside the bladder, and five in the sensing section which is positioned within the urethra at the point at which the urinary sphincter constricts to control the flow of urine. The remainder of the length of the probe comprises multiple rigid support tube sections interspersed with flexible support tube sections in the form of bellows to provide flexibility.

0701 Clone of a Double-Stranded RNA Virus Applied to Antibody Production, Study of Retrovirus-Like Frameshifting and Production of Proteins in Yeast
R. B. Wickner, J. Dinman, T. Icho
Department of Labor, Washington, DC
Filed 9 Mar 90 40p
PAT-APPL-7-492 364 Available from NTIS: price code N03
The invention relates to a DNA segment that encodes a double-stranded RNA genome of a yeast virus. More particularly, the invention is related to a cDNA clone of the genome of the L-A virus, or a unique portion thereof, and various applications of the clone, including a method for determining the effect of an agent on translational frameshifting directed by a viral nucleotide sequence.

0702 Cloned Subgenomic Fragments of HIV-1 GAG Genes
S. Marcus
National Institutes of Health, Bethesda, MD
Filed 1 Mar 90 22p
PAT-APPL-7-486 958 Available from NTIS: price code N03
The objects of the invention are: to provide a method for identifying immunodominant epitopic regions of antigenic proteins; to clone subgenomic fragments of the HIV-1 gag gene; to isolate unique antigens encoded by specific subgenomic fragments of HIV-1 gag gene; and to provide partial components which could be incorporated into a test kit containing new reagents for detecting HIV-1 infection.

0703 Cloning and Expression of Biologically Active Fragment C of Tetanus Toxin
S. Stibitz, J. Halpern
Food and Drug Administration, Rockville, MD
Filed 30 Jun 89 23p
PAT-APPL-7-373 862 Available from NTIS: price code N03
The purpose of the invention is to provide an improved means for the production of biologically active tetanus toxin fragment C. The fragment C so produced may be used for the identification of cells of neuronal origin. The fragment C so produced may also be used as an immunogen to elicit production of neutralizing antibodies to tetanus toxin.

0704 Cloning and Expression of HTLV-III DNA
N. Chang
National Institutes of Health, Bethesda, MD
Filed 23 Jan 85 58p
PAT-APPL-6-693 866 Available from NTIS: price code N03
The invention is based upon cloning of HTLV-III DNA in recombinant/vector host systems capable of expressing immunoreactive HTLV-III polypeptides. Based on the cloning of HTLV-III DNA in systems which express immunoreactive-polypeptides, methods have been developed which are useful in the diagnosis, treatment and prevention of AIDS. Methods have been developed to detect HTLV-III and antibodies against HTLV-III in body fluids (e.g., blood, saliva, semen), and methods useful in immunotherapy (e.g., vaccination and passive immunization against AIDS). In addition, methods of making HTLV-III DNA probes and RNA probes useful in detecting HTLV-III in body fluids have been developed.

0705 Co-Expression and Interaction of Two Sub-Units of Vaccinia Virus Capping Enzyme
B. Moss
National Institutes of Health, Bethesda, MD
Filed 10 May 90 22p
PAT-APPL-7-521 682 Available from NTIS: price code A03
The objects of the invention are: to provide recombinantly produced vaccinia virus capping enzyme and a host cell for production; and to provide recombinantly produced vaccinia virus capping enzyme for specifically capping the 5' ends of mRNA and synthetic oligoribonucleotides. Capped mRNA has enhanced translatability. Further, the original ends can be identified and differentiated from those formed by processing or degradation.

0706 CO2-Independent Growth Medium for Maintenance and Propagation of Cells
D. Vistica
National Institutes of Health, Bethesda, MD
Filed 22 Jan 90 32p
PAT-APPL-7-467 939 Available from NTIS: price code N03
The objects of the invention are to provide a cellular growth medium which, unlike known growth media, supports the growth of a wide variety of tumor and non-tumor cells of human and non-human origin in a non-CO2 enriched atmosphere; to provide a CO2-independent culture medium suitable for an in vitro anticancer drug screen, employing a broad panel of human tumor cell lines; and to provide a CO2-independent culture medium suitable for a wide variety of cell culture technologies where employing CO2 to control the medium pH is cumbersome, expensive, impractical or undesirable.

Coating and Composition Containing Lipid Microstructure Toxin Dispensers
See 0536

0707 Colloid labelled with radionuclide and method
R. W. Atcher, J. J. Hines
Argonne National Lab., IL.; Department of Energy, Washington, DC
Filed 30 May 89 17p
PAT-APPL-7-358 732 Available from NTIS: price code A03
This report discusses a ferric hydroxide colloid having an alpha-emitting radionuclide essentially on the outer surfaces and a method of forming same. The method includes oxidizing a ferrous hydroxide to ferric hydroxide in the presence of a preselected radionuclide to form a colloid having the radionuclide on the outer surface thereof, and thereafter washing the colloid, and suspending the washed colloid in a suitable solution. The labeled colloid is useful in cancer therapy and for the treatment of inflamed joints. 3 tabs.

Compact Drill Sampler for Quantitation of Microorganisms in Wood
See 0446

0708 Contraceptive Vaccine Based on Cloned Zona Pellucide Genes
D. Jurrien
National Inst. of Diabetes and Digestive and Kidney Diseases, Bethesda, MD
Filed 12 Jun 89 93p
PAT-APPL-7-364 379 Available from NTIS: price code N03
The invention relates to a contraceptive vaccine for use in a mammalian female comprising a polypeptide which includes an amino acid sequence that is selected to display at least one epitope for binding of an antibody that inhibits fertilization of an oocyte by a sperm. The contraceptive antibody epitope is an epitope for which there is a functional homolog displayed on a zona pellucida protein that originates from the species in which the said vaccine is used. The zona pellucida protein displaying the functionally homologous epitope advantageously is either a ZP3 protein or a ZP2 protein or a ZP1 protein.

0709 Control of Insects by Roseotoxin B
P. F. Dowd, R. J. Cole
Department of Agriculture, Washington, DC
Filed 2 May 88, patented 11 Sep 90 1p
PATENT-4 956 343 Available from Comm. of Patents
Roseotoxin B, a cyclodepsipeptide which is relatively nontoxic to mammals was found to cause mortality and significant reduction in growth when fed to neonate larvae of the corn earworm and southern armyworm as a component of the diet. Thus, it may be used to control Lepidopteran insect pests.

0710 Control of Parasitic Nematode Ova/Larvae with 'Bacillus laterosporus'
L. W. Bone, S. Singer
Agricultural Research Service, Washington, DC
Filed 14 Nov 89 13p
PAT-APPL-7-436 154 Available from NTIS: price code N03
The object of the invention is to provide an agent having ovicidal activity against nematodes in a host animal's habitat. Another object of the present invention is to provide a bacterial preparation comprising a toxin having ovicidal activity as well as to provide means of enhancing the ovicidal activity of a toxin produced by B. laterosporus.

Controlled Method of Reducing Electrophoretic Mobility of Various Substances
See 0107

0711 Crystal Growth Apparatus
F. T. Herrmann, B. J. Herren
National Aeronautics and Space Administration, Huntsville, AL. George C. Marshall Space Flight Center
Filed 29 Feb 88, patented 24 Apr 90 9p
PATENT-4 919 899 Available from Comm. of Patents
This invention relates generally to crystal growth devices, and more particularly to a device in which protein crystals are grown in a hanging drop. The drop is suspended from a surface positioned in the interior of an enclosure which is sealably coupled via a valve to a vessel containing solvent used in the drop. A second opening in the enclosure is coupled via a valve to a vessel containing a selected desiccant material. The valve may be fully or partially opened to add a selected quantity of solvent in a vapor phase to the drop, and the valve may be fully or partially opened to cause a selected quantity of solvent to evaporate from the drop. The process is monitored by a camera, and in conjunction with a graduated pattern superimposed over the drop, relative volumes of the drop are determined. Alternately, the process may be automated by using a computer coupled to servo motors, which in turn are coupled to and operate a cap and valves, respectively. The computer is responsive to a detection device which detects changes of light passing through the drop from the light source.

0712 Derivatization of Amines for Electrochemical Detection
K. A. Jacobson, K. L. Kirk, I. Linnoila, T. Miller, K. Mine
Department of Health and Human Services, Washington, DC
Filed 27 Dec 88, patented 13 Mar 90 11p
PATENT-4 908 322 Available from Comm. of Patents
The objects of the present invention are: to provide a method for the analysis of fluids containing amines which overcomes the disadvantages of prior art methods; to provide a process for the analysis of fluids containing amines which does not require an overly burdensome number of manipulations per sample; to provide a method for the coulometric detection of both electroactive and non-electroactive amines in biological fluids; and to provide a method for the electrochemical quantitative detection of certain amines

in fluids which had not previously been detectable by electrochemical methods.

0713 Design and Construction of Non-Infectious Human Retroviral Mutants Deficient in Genomic RNA
R. J. Gorelick, A. Rein, L. O. Arthur, L. E. Henderson, S. Oroszlan
National Institutes of Health, Bethesda, MD
Filed 31 Oct 89 42p
PAT-APPL-7-429 287 Available from NTIS: price code N03
An object of the invention is to define a biological role for the following sequence of amino acids that is found in the nucleocapsid domain of the gag precursor polyproteins of all replication-competent retroviruses: -Cys-X-X-Cys-X-X-X-X-His-X-X-X-X-Cys- wherein X represents variable amino acids. Another object of the present invention is to drastically reduce or eliminate the infectivity of any retrovirus, including human retroviruses, and more particularly human immunodeficiency virus (HIV), by generating mutants that lack some or all of the invariant residues required to form the structure; to utilize said mutants in the design of vaccines; to develop effective therapeutic agents utilizing said mutants and to develop diagnostic procedures for the detection of all infectious retroviruses.

0714 Design and Construction of Non-Infectious Retroviral Mutants Deficient in Viral RNA
S. Gorelick
National Institutes of Health, Bethesda, MD
Filed 10 Nov 88 27p
PAT-APPL-7-269 407 Available from NTIS: price code N03
The object of the invention is to define a biological role for the following sequence of amino acids that is found in the nucleocapsid domain of the gag precursor polyproteins of all replication-competent retroviruses: -Cys-X-X-Cys-X-X-X-X-His-X-X-X-X-Cys- wherein X represents variable amino acids. The invariant residues constitute part of a vital protein structure common to all retroviruses and involved in the selection and packaging of genomic viral RNA into infectious virus particles. Other objects of the inventions are to drastically reduce or eliminate the infectivity of any retrovirus by generating mutants that lack some or all of the invariant residues required to form the structure and to utilize said mutants in the design of vaccines.

0715 Detection and Recovery of Virulent 'Yersinia enterocolitica' Using Congo Red Agarose Media
S. Bhaduri
Agricultural Research Service, Washington, DC
Filed 15 Mar 90 22p
PAT-APPL-7-493 662 Available from NTIS: price code N03
The invention comprises a Congo Red (CR) dye binding method, and the CR culture medium used in the method, for detecting plasmid-bearing virulent strains of Yersinia enterocolitica, in which a bacterial sample is grown at 37 deg C to 40 deg C on a low-calcium, agarose-based medium containing CR dye for sufficient time for plasmid-bearing Yersinia enterocolitica to be visually distinguishable, both from other species of bacteria and from Yersinia enterocolitica not containing the plasmid. Plasmid-bearing virulent strains (P+ clones), when grown on this medium, bind CR to form red colonies (CR+), which colonies are round, convex and pinpoint in size. Plasmid-less avirulent strains (P- clones) fail to bind the CR dye, forming colorless or light orange colonies (CR-), which are much larger, irregular and flat.

0716 Diagnostic Kit and Diagnostic Method Utilizing Carbohydrate Receptors
V. Ginsburg, H. C. Krivan, D. D. Roberts
National Institutes of Health, Bethesda, MD
Filed 5 Oct 89 49p
PAT-APPL-7-417 691 Available from NTIS: price code N03
The invention is directed to a diagnostic device for adsorbing microorganisms which comprises an insoluble substrate and a carbohydrate receptor capable of adsorbing bacteria bound to the insoluble substrate. The invention also relates to a method for detecting the presence of specified microorganisms in a sample which comprises contacting a sample to be tested with carbohydrate receptors bound to an insoluble substrate and determining the extent of binding of a microorganism in the sample to the carbohydrate receptors bound to the substrate.

0717 Diagnostic Test for Pineal Cell Tumors
D. Klein, J. Bruce, H. Korf
Department of Health and Human Services, Washington, DC
Filed 19 Jun 89 19p
PAT-APPL-7-368 270 Available from NTIS: price code N03
A novel method of diagnosing pineal cell tumors by detecting S-antigen in CSF is described.

0718 Dietary Supplementation with Essential Metal Picolinates
G. W. Evans
Department of Agriculture, Washington, DC
Filed 26 Feb 90 9p
PAT-APPL-7-484 549 Available from NTIS: price code N03
The objects of the invention are: to provide a composition and method for selectively supplementing the essential metals in the diets of humans and mammalian animals, and for facilitating absorption of these metals by the intestinal cells; to correct predetermined metal deficiencies in mammals and to eliminate the symptoms of those deficiencies without concurrently reducing the assimilated levels of other essential metals; and to administer trace elements in a safe, physiological form; that is, in the same form endogenously produced and utilized by the normal mammalian body.

0719 DNA Binding Protein
I. Pastan, R. Kageyama
National Cancer Inst., Bethesda, MD
Filed 28 Nov 89 43p
PAT-APPL-7-441 912 Available from NTIS: price code N03
The invention to a DNA binding protein, and, in particular, to a DNA binding protein that represses transcription from promoters to which it binds. The invention further relates to a DNA sequence encoding the DNA binding protein, to a recombinant DNA molecule that includes such a sequence and to cells transformed therewith. The invention further relates to a method of regulating gene expression.

0720 DNA Encoding a Growth Factor Specific for Epithelial Cells
J. S. Rubin, P. W. Finch, S. A. Aaronson
National Cancer Inst., Bethesda, MD
Filed 31 Jan 89 99p
PAT-APPL-7-304 281 Available from NTIS: price code N03
The present invention relates to a novel protein having structural and/or functional characteristics of a known family of growth factors which includes acidic fibroblast growth factor (aFGF), basic fibroblast growth factor (bFBF) and the related products of the hst and int-2 oncogenes. Accordingly, the invention relates, in part, to purified KGF or KGF-like proteins and methods for preparing these proteins. The invention also relates to such DNA segments which encode KGF or KGF-like proteins. In a principal embodiment, the present invention relates to DNA segments, which encode KGF-related products.

0721 DNA Encoding IgE Receptor alpha Subunit or Fragment Thereof
R. Sraganian
National Institutes of Health, Bethesda, MD
Filed 1 Dec 87 14p
PAT-APPL-7-127 214 Available from NTIS: price code N03
The invention features a cDNA sequence encoding the alpha-subunit of human mast cell IgE surface receptor. The invention also features a vector (plasmid or viral) containing DNA encoding the alpha-subunit of human mast cell IgE surface receptor. The invention additionally features a soluble fragment of the alpha-subunit of human mast cell IgE surface receptor, such fragment being capable of binding to human IgE. The human IgE receptor alpha-subunit, or fragments therof, made according to the invention can be used in a variety of diagnostic and therapeutic applications.

Double Antibody ELISA for HEV Antigen and Antibody
See 0009

0722 Dynamically Stable Associative Learning Neuron Circuit and Neural Network
D. Alkon
Department of Health and Human Services, Washington, DC
Filed 17 May 89 36p
PAT-APPL-7-353 107 Available from NTIS: price code N03
The invention is a neuron circuit with a unique learning rule. The adaptive weight circuit adjusts the weights as follows. The weight of a synapse is increased if that particular synapse and a predetermined set of other synapses all receive nonzero signals on their respective synaptic inputs for both the current time and the immediately prior time. The weight of a synapse is retained as the same if the particular synapse receives nonzero signals on its inputs for both the current time and the immediately prior time and the predetermined set of other synapses do not all receive nonzero signals on their respective synaptic inputs for both the current time and the immediately prior time. In all other cases the adaptive weight circuit reduces the weight of the particular synapse.

0723 Efficient Method for Identifiable Expression of Non-Selectable Genes
S. Kane, I. Pastan, M. Gottesman
Department of Health and Human Services, Washington, DC
Filed 23 Jun 89 22p
PAT-APPL-7-370 619 Available from NTIS: price code N03
A recombinant plasmid vector is provided for identifiable, amplified expression of a non-selectable gene, utilizing the dominant selectable MDR phenotype.

0724 Encapsulation by Entrapment within Matrix of Unmodified Starch
W. M. Doane, S. Maiti, R. E. Wing
Department of Agriculture, Washington, DC
Filed 10 Jul 87, patented 27 Mar 90 10p
PATENT-4 911 952 Available from Comm. of Patents
Chemical biological agents to be encapsulated are blended into an aqueous dispersion of an unmodified starch comprising about 5% to about 25% by weight amylose. The dispersion, having an initial starch solids content of about 20% by weight, is characterized by completely disrupted starch granules and completely disassociated amylose molecules that are not significantly depolymerized. Subsequent drying is accomplished by reassociation of the amylose molecules which converts the dispersion into a protective matrix and binds the agents within the interstices of the reassociating starch chains. Rate of release of agents to the environment can be altered by varying the proportion of amylose in the starch. Encapsulation of biologically active compositions provides protection against degradative environmental conditions, improves safety in handling, and slows the release of such compounds to the surrounding medium.

Enhancement of Nitrogen Fixation with Bradyrhizobium Japonicum Mutants
See 0010

0725 Enzymatic Processing of Materials Containing Chromium and Protein
M. M. Taylor, E. J. Diefendorf, G. C. Na, W. N. Marmer
Agricultural Research Service, Washington, DC
Filed 8 Feb 90 36p
PAT-APPL-7-476 843 Available from NTIS: price code N03
The objects of the invention are to avoid the heating of chrome wastes to a high temperature and thereby reduce the amount of time and energy required to heat said wastes; to provide a process which is far more economical and commercially feasible than the prior art processes; to provide processes for converting chromium containing materials into useful products; to provide a novel source of chromium for recycling into the pickling and/or tanning process; to provide such processes which are far more economical, and avoid chromium disposal problems; to provide a source of hydrolyzed protein that can be isolated and purified for incorporation into a variety of products; and to avoid the possible risk of contaminating the environment with toxic chromium compounds.

0726 Evaluative Means for Detecting Inflammatory Reactivity and for Predicting Response to Stress
E. M. Sternberg, R. L. Wilder, G. P. Chrousos, P. W. Gold
National Institutes of Health, Bethesda, MD
Filed 18 Oct 89 65p
PAT-APPL-7-422 791 Available from NTIS: price code N03

The object of the invention is to provide a method for testing mammals for susceptibility to inflammatory diseases. In its broadest aspect, the method comprises the steps of administering to a mammal a compound which is effective in stimulating the hypothalamic-pituitary-adrenal (HPA) axis and measuring the level of hormones secreted by the pituitary and adrenal glands of the mammal. In a more specific aspect, the method comprises the steps of administering to a mammal a compound selected from the group consisting of cytokines, cell growth factors, neuroendocrine hormones such as corticotropin releasing hormone (CRH) or arginine vasopressin (AVP), biogenic amines, agonists of biogenic amines, antagonists of biogenic amines, analogues of biogenic amines, monoamine oxidase inhibitors and biogenic amine uptake inhibitors or glucocorticoid receptor antagonists and measuring the level of glucocorticoid or adrenocorticotropic hormone (ACTH) in the blood plasma of the mammal.

Flow Immunosensor Method and Apparatus
See 0041

0727 Fluorogenic Substrates for Measurement of Lysosomal Enzyme Activities within Intact Cells
S. P. F. Miller, R. O. Brady
National Institutes of Health, Bethesda, MD
Filed 30 Mar 90 34p
PAT-APPL-7-501 797 Available from NTIS: price code N03
The invention relates to fluorogenic substrates and compositions containing the same use for detecting the activity of enzymes within intact cells. More specifically, the present invention relates to lysosomotropic derivatives of 2,3-dicyano-hydroquinone (DCH), compositions containing the same and methods employing the same for detecting lysosomal enzymatic activity within intact cells.

0728 Genetically engineered acidophilic heterotrophic bacteria by bacteriophage transduction
T. E. Ward, D. F. Bruhn, D. F. Bulmer
EG and G Idaho, Inc., Idaho Falls.; Department of Energy, Washington, DC
Filed 10 May 89 18p
PAT-APPL-7-350 662 Available from NTIS: price code A03
A bacteriophage capable of infecting acidophilic heterotrophic bacteria and processes for genetically engineering acidophilic bacteria for biomining or sulfur removal from coal are disclosed. The bacteriophage is capable of growth in cells existing at pH at or below 3.0. Lytic forms of the phage introduced into areas experiencing acid drainage kill the bacteria causing such drainage. Lysogenic forms of the phage having genes for selective removal of metallic or nonmetallic elements can be introduced into acidophilic bacteria to effect removal of the desired element from ore or coal. 1 fig., 1 tab.

0729 Grooming and/or Foraging Apparatus for Reduction of Stress in Caged Animals
K. Bayne
Department of Health and Human Services, Washington, DC
Filed 25 Aug 89 15p
PAT-APPL-7-398 564 Available from NTIS: price code N03
Grooming and/or foraging opportunities are provided for caged animals, specifically to nonhuman primates, in order to enrich the environment thereof thus to reduce boredom and stress of the animals. By increasing normative behavior, the inventive method and apparatus reduce abnormal behavior and broaden the behavioral repertoire of the animal. The inventive structure includes a hard backing board of Plexiglass, Lexan, metal or other similar materials, covered with a natural or artificial cloth, fur, fleece, carpeting or the like. Food particles of different sizes with rough edges may be rubbed into the cloth material to elicit foraging activities from the animal.

0730 Growing Ehrlichia Species in a Continuous Cell Line
J. Dawson
National Institutes of Health, Bethesda, MD
Filed 3 May 90 13p
PAT-APPL-7-518 182 Available from NTIS: price code N03
The invention is related generally to the method of culturing microorganisms. More particularly, the present invention is related to a method of continually growing an obligate intracellular bacterium such as Ehrlichia canis (E. canis), E. risticii, E. sennetsu, E. phagocytophila and Neorickettsia helminthoeca in a canine macrophage cell line. It is the object of the invention to provide a new method for continual propagation of E. canis in a cell line distinctly different from the MDH cell line.

0731 Hanging Drop Crystal Growth Apparatus and Method
D. C. Carter, R. Smith
National Aeronautics and Space Administration, Huntsville, AL. George C. Marshall Space Flight Center
Filed 23 Mar 88, patented 12 Dec 89 11p
PATENT-4 886 646 Available from Comm. of Patents
This invention relates generally to hanging drop crystal growth devices and methods, and more particularly to such a device wherein the drop containing protein to be crystallized is exposed to vapor from a flow of control fluid, with this control fluid having a vapor pressure which varies as solvent is drawn from the drop. A hanging drop apparatus is constructed having a cylindrical enclosure, with a wicking element or disc constructed of sintered glass and being mounted in an upper portion thereof. A well or recess is cut into an upper side of the disc. A cover slip or plate having a protein drop disposed thereon is sealably positioned on the disc, with the drop being positioned in the well. A flow of control fluid is generated by a programmable gradient former, with this flow being coupled to the disc. The vapor pressure of the control fluid is initially selected to be considerably lower than that of the drop, causing solvent in the drop to readily evaporate. As evaporation progresses, the vapor pressure of the control fluid is adjusted to slow the rate of evaporation from the drop, allowing a slow approach to the critical supersaturation point of the protein to be crystallized. The novelty of this invention particularly lies in exposing the drop to a control fluid having a variable pressure. Further novelty lies in the particular apparatuses and methods by which this is accomplished.

0732 Helmet-Mounted Head Restraint
M. H. Patterson
Department of the Navy, Washington, DC
Filed 2 Nov 88 12p
PAT-APPL-7-266 955 Available from NTIS: price code N03
A head restraint for the occupant of a vehicle seat is disclosed, which restrains the forward and downward movement of the occupant's head when subjected to large deceleration forces. The restraint includes a strap assembly

which encircles the back of the occupant's head and releasably connects to his helmet adjacent to each of his ears at two locations. A retaining strap is slidably connected by a loop to the strap assembly and extends behind the head to a retracting means fixed in the seat. The retracting means pulls the head back against the seat when the deceleration forces exceed a predetermined level, as during flight maneuvers. During normal flight conditions, the occupant is able to move his head freely from side to side as the strap assembly slides through the loop. Keywords: Patent applications.

0733 Hepatocellular Oncogene
S. S. Yang
National Cancer Inst., Bethesda, MD
Filed 19 Dec 89 29p
PAT-APPL-7-451 953 Available from NTIS: price code N03
The invention relates to an oncoprotein coded for by a transforming nucleotide sequence of hepatocellular carcinomas and to the transforming sequence itself. The invention further relates to unique portions (i.e., at least 5 amino acids) of the oncoprotein, and to nucleotide sequences (fragments) that code for such polypeptides. The invention further relates to nucleotide segments sufficiently complementary to the above-described nucleotide sequences (fragments) to be usod as probes for detecting the presence of such nucleotide sequences (fragments). The invention also relates to diagnostic and screening methodologies for use in detecting the presence of hepatocellular carcinomas (as well as preneoplastic or pathological conditions of the liver) in a warm blooded animal.

0734 High Efficiency Packaging of Mutant Adeno-Associated Virus Using Amber Suppression
B. J. Carter, N. Chejanovsky
National Inst. of Diabetes and Digestive and Kidney Diseases, Bethesda, MD
Filed 15 Jun 89 27p
PAT-APPL-7-366 130 Available from NTIS: price code N03
The invention refers to the construction of an adeno-associated virus (AAV) plasmid containing an amber mutation within the AAV rep gene and the propagation of this mutant on the amber suppressor monkey cell lines. It is shown that relatively pure populations of the AAV particles containing mutant genomes could be generated having a reversion of the amber mutant to wild-type less than 10

0735 HIV (Human Immunodeficiency Virus) Subunit Vaccine
K. Krohn, A. Ranki
National Cancer Inst., Bethesda, MD
Filed 11 Mar 88 29p
PAT-APPL-7-168 088 Available from NTIS: price code N03
The invention provides immunogenic peptide sequences of the gp120 envelope protein of the human immunodeficiency virus (HIV). Epitopes from the conserved region which give rise to neutralizing antibodies are described.

Hollow Fiber Clinostat: Technical Abstract
See 0631

0736 Human Esophageal Epithelial Cell Lines
G. D. Stoner, R. R. Reddel, C. C. Harris, R. Roger
Department of Health and Human Services, Washington, DC
Filed 27 Sep 89 39p
PAT-APPL-7-412 802 Available from NTIS: price code N03
Human esophageal epithelial cells having replicative capacity in cell culture that is enhanced compared to normal cells and are unable to produce tumors is disclosed. Normal human esophagus tissue from two autopsy specimens was explanted in serum-free medium. Epithelial outgrowths were subcultured, then transfected by strontium phosphate coprecipitation with plasmid pRSV-T consisting of the RSV-LTR promoter and the SV40 large T-antigen gene. The transfected cells formed multilayered colonies within 3-4 weeks, which were transferred and developed into cell strains (HE-451 and HE-457). Both strains grew exponentially for 8-10 weeks, then senesced. After a 'crisis' of 6-8 months, isolated colonies developed into two lines, HET-1A from HE-457 and HET-2A from HE-451. These have now undergone 143 and 122 population doublings, respectively.

0737 Human Serum Albumin Crystals and Method of Preparation
D. C. Carter
National Aeronautics and Space Administration, Huntsville, AL. George C. Marshall Space Flight Center
Filed 20 Aug 87, patented 23 May 89 8p
PATENT-4 833 233 Available from Comm. of Patents
Human serum albumin (HSA) crystals are provided in the form cf tetragonal plates having the space groups P42(sub 1)2, the crystals being grown to sizes in excess of 0.5 mm in two dimensions and a thickness of 0.1 mm. Growth of the crystals is carried out by a hanging drop method wherein a precipitant solution containing polyethylene glycol (PEG) and a phosphate buffer is mixed with an HSA solution, and a droplet of mixed solution is suspended over a well of precipitant solution. Crystals grow to the desired size in 3 to 7 days. Concentration of reagents, pH and other parameters are controlled within prescribed limits. The resulting crystals exhibit a size and quality such as to allow performance of x ray diffraction studies and enable the conduct of drug binding studies as well as genetic engineering studies.

0738 Human Synexin and Cloned Gene Therefor
A. Burns
National Institutes of Health, Bethesda, MD
Filed 2 Feb 90 18p
PAT-APPL-7-474 469 Available from NTIS: price code N03
The objects of the invention are to provide a clone containing full length cDNA for the expression of human synexin; and to provide isoloated, substantially pure, active, human synexin in a state not present in the nature.

0739 Hybridomas and Monoclonal Antibodies Therefrom Having Specific Reactivity Toward Heavy Chain Immunoglobulin from Catfish
P. H. Klesius
Department of Agriculture, Washington, DC
Filed 27 Jul 89 15p
PAT-APPL-7-385 752 Available from NTIS: price code N03
A hybridoma cell line which produces a monoclonal antibody with reactivity directed specifically to catfish immunoglobulin heavy chain having a molecular weight of 70,000

daltons was discovered. The hybridoma monoclonal antibody is specific for immunoglobulin of catfish species but not for other fresh-water fish species. Purification and quantitation of immunoglobulin from body fluids and cells of catfish may be accomplished with this monoclonal antibody. The hybridoma cell line and monoclonal antibody produced is also useful for identification and purification of immunogens from economically important agents of catfish.

0740 Hybridomas and Monoclonal Antibodies Therefrom Reactive Toward Antigens from 'Edwardsiella ictaluri'
P. H. Klesius
Agricultural Research Service, Washington, DC
Filed 3 Nov 89 16p
PAT-APPL-7-431 348 Available from NTIS: price code N03
A hybridoma cell line which produces Mabs that bind selectively to antigens from E. ictaluri having a molecular weight of about 14,000, 39,000, 48,000, 60,000, 66,000, 83,000, and 93,000 daltons was constructed. An objective of the invention is to provide murine hybridoma cell lines which produce monoclonal antibodies specific for E. ictaluri and its antigens. It is a further objective of the invention to provide monoclonal antibodies as immunochemical reagents for the identification and purification of the aforementioned antigens, as reagents for diagnosis of E. ictaluri, and for the development of vaccines against E. ictaluri.

Immunotoxins for Treatment of Intracranial Lesions and as Adjunct to Chemotherapy
See 0659

Improved Toxin for Construction of Immunotoxins
See 0660

Inhibiting Plant Pathogens with an Antagonistic Microorganism(s)
See 0014

Inhibiting Plant Pathogens with Nonantibiotic Antagonistic Microorganism(s)
See 0015

Inhibition of Human Immunodeficiency Virus -1 Infectivity in Human Cells
See 0661

Inhibition of Malignant Cells Having GM1 Ganglioside Sites by Administration of Cholera Toxin
See 0662

Insect Detection Using a Pitfall Probe Trap Having Vibration Detection
See 0016

Ionizing radiation detector
See 0423

0741 Isolation and Characterization of a Plasma Protein Which Binds to Activated C4 of the Classical Complement Pathway
C. H. Hammer, R. M. Jacobs, M. M. Frank
Department of Health and Human Services, Washington, DC
Filed 2 Feb 89 41p
PAT-APPL-7-305 548 Available from NTIS: price code N03
A previously unknown, substantially pure, single chain, plasma protein of approximately 120 kDa (hereinafter 'the 120 kDa protein') which binds to activated C4 and C3 of the classical complement pathway and which inhibits lytic functional activity of the pathway at multiple steps (including but not limited to C1, C4, C2 and C3 site formation) is disclosed. Studies on the intact and fragmented protein reveal that a mixture of the fragments, but not the intact protein molecule, has potent vasodialating activity when injected into normal guinea pigs. In addition to disclosing the 120 kDa protein, the application also discloses a method whereby the protease sensitive, plasma protein can be isolated, substantially purified and identified for use.

0742 Karposi's Sarcoma Endothelial Cells and Growth Factor
S. Z. Salahuddin, S. Nakamura, R. C. Gallo
National Institutes of Health, Bethesda, MD
Filed 15 Nov 88 48p
PAT-APPL-7-261 014 Available from NTIS: price code A03
A growth factor which supports growth of Kaposi's sarcoma and which contains neoangiogenic properties has been isolated. Tests which utilize this growth factor in growth media have been used as tools for diagnosing Kaposi's sarcoma and for evaluating the disease process. The assay systems used for monitoring the activity of this growth factor and the resulting growing AIDS-KS cells are valuable tools, since they will facilitate the evaluation of the drugs and therapeutic strategy.

0743 Kojic Acid and Esters as Insecticide Synergists
P. F. Dowd
Department of Agriculture, Washington, DC
Filed 16 Jun 88, patented 11 Sep 90 1p
PATENT-4 956 353 Available from Comm. of Patents
Kojic acid and its esters have been found to be more effective synergists for pyrethroid and carbamate insecticides on H. zea and S. frugiperda. Thus they may serve as replacements for the widely used methylene dioxyphenyl compounds such as piperonyl butoxide.

Lactose Hydrolysis by Mutant 'Streptococcus thermophilus'
See 0017

0744 'Listeria monocytogenes' Oligonucleotide Probes
A. Datta
Food and Drug Administration, Rockville, MD
Filed 25 Sep 89 24p
PAT-APPL-7-411 965 Available from NTIS: price code N03
The invention provides synthetic probes which can be synthesized readily for use in identifying L. monocytogenes using colony hybridization assays in cultures from milk and cheese. In most reported cases of listeria outbreaks, dairy products are found to be the source of the infection. The probes of the present invention have been tested in dairy products, particularly raw milk and semisoft cheese samples. The contaminated products were easily identified using the probes of the invention.

0745 Mammalian hnRNP Complex Al and Method for Large-Scale Overproduction in E. Coli
S. Wilson
National Institutes of Health, Bethesda, MD
Filed 28 Sep 88 54p
PAT-APPL-7-250 405 Available from NTIS: price code N03
The invention relates to single-stranded DNA-binding proteins and methods for their production. Specifically, the invention relates to mammalian hnRNP complex protein A1

and methods for its large-scale overproduction in E. coli and its cooperative binding to single-stranded nucleic acids.

0746 Matrix Metalloproteinase Inhibitor Peptides
W. G. Stetler-Stevenson, L. A. Liotta, H. C. Krutzsch
National Institutes of Health, Bethesda, MD
Filed 13 Mar 90 54p
PAT-APPL-7-494 796 Available from NTIS: price code A04
The objects of the invention are: to provide means of purifying natural inhibitors of metalloproteinases; to provide matrix metalloproteinase inhibitors and derivatives thereof. The inhibitors may be obtained from natural sources, may be produced by synthetic means such as the Merrifield peptide synthesis process, or by genetically engineered organisms or cell lines. The inhibitors of the invention may be used to treat disease conditions which result from activity of matrix metalloproteinases.

0747 Membrane Based Dot Immunoassay and Method of Use
J. J. Oprandy
Department of the Navy, Washington, DC
Filed 30 Jan 89 20p
PAT-APPL-7-303 191 Available from NTIS: price code N03
Antigens or antibodies are detected using a novel membrane based immunoassay. Known antigens or antibodies which will form complexes with antigens/antibodies to be assayed are spot filtered with pressure through a membrane. The membrane, either by itself or attached to a base material as a test strip, is incubated with a test fluid. Consequently, the resulting antibody-antigen complex is incubated directly or after an intermediate anti-antibody incubation with enzyme conjugated immunoglobulin and exposed to substrate which produces a colored insoluble product if the test target is present. Patent applications.

0748 Metalloproteinase Peptides: Role in Diagnosis and Therapy
L. A. Liotta, W. Stetler-Stevenson, H. Krutzsch
National Cancer Inst., Bethesda, MD
Filed 1 Mar 89 44p
PAT-APPL-7-317 407 Available from NTIS: price code A03
The objects of the invention are: to provide peptide sequences that have blocking activity against the metalloproteinase; to provide antibodies for use in identifying the presence of metalloproteinase; and to provide a method of treating patients suffering tissue damage arising from tissue destruction caused by activated metalloproteinase.

Method and Apparatus for Characterizing Reflected Ultrasonic Pulses
See 0635

Method and Apparatus for In situ Biological Conversion of Coal to Methane
See 0390

0749 Method and apparatus for obtaining microorganisms from water for genetic probing
T. C. Hazen
Du Pont de Nemours (E.I.) and Co., Aiken, SC.; Department of Energy, Washington, DC
Filed 14 Jul 89 13p
PAT-APPL-7-379 753 Available from NTIS: price code A03
A method and apparatus for obtaining microorganisms from water, such as groundwater, for genetic probing in sufficient quantities so that culturing the microorganisms is avoided, comprising placing an electrically charged microporous filter in the flow of the water, filtering several hundred gallons of water with the filter, concentrating the microorganisms in the filter, lysing the concentrated microorganisms, extrating and purifying the DNA, and then probing. A electropositively charged filter of a nominal pore size of 0.2 micrometers will produce samples suitable for probing after filtering 500 to 1000 gallons.

0750 Method and Apparatus for Testing the Permeability of Prophylactics
M. Retta
National Institutes of Health, Bethesda, MD
Filed 6 Apr 90 26p
PAT-APPL-7-505 268 Available from NTIS: price code N03
Development of an apparatus for determing the permeability of various membranes made from rubber, latex, or other elastomers, in particular, condoms, is the object of the invention. Methods of testing condoms for permeability under physiologic conditions are developed.

0751 Method and Composition for Growing Tumors from Few Cells
R. Fridman, H. Kleinman, G. Martin
National Institutes of Health, Bethesda, MD
Filed 30 Mar 90 34p
PAT-APPL-7-501 798 Available from NTIS: price code N03
The invention relates to a method of rapidly growing tumors in animals from tumor cells or tissues including those of human origin by combining the desired tumor cells to be grown with matrigel, a reconstituted basement membrane, and injecting the mixture into the animal host.

Method and Device for Improved Use of Heart/Lung Machine
See 0636

0752 Method for Detecting Amine-Containing Drugs in Body Fluids by SIMS
D. Kidwell
Department of the Navy, Washington, DC
Filed 5 Feb 85, patented 20 Feb 90 18p
PATENT-4 902 627 Available from Comm. of Patents
This patent discloses a method of analyzing a sample for selected molecules which consists of reacting the molecule with a reagent that produces a charged derivative which can be desorbed and analyzed using Secondary Ion Mass Spectrometry (SIMS).

0753 Method for Detecting Inhibitors of tat Protein
F. Wong-Stall
National Institutes of Health, Bethesda, MD
Filed 6 Feb 89 16p
PAT-APPL-7-306 612 Available from NTIS: price code N03
The invention provides an assay which will indicate inhibition of binding of tat protein to TAR. The invention provides a method for evaluating agents which bind tat as a means of identifying useful therapeutic agents. It also provides reliable methods for producing large amounts of tat protein.

0754 Method for Detecting Phosphatidylinositol through Binding to Concanavalin A
N. M. Wassef, C. R. Alving
Department of the Army, Washington, DC
Filed 11 Jul 86, patented 5 Sep 89 7p
PATENT-4 863 874 Available from Comm. of Patents

A method for the specific detection of inositol and phosphatidylinositol within a model membrane such as liposomes or within a cellular system such as T lymphocytes is presented. Patents.

Method for Removal of Gossypol from Cottonseed Meal by the Use of Urea in a Borate Containing Buffer
See 0020

0755 Method for the Fluorescent Detection of a DNA Sequence in Real Time
S. Hughes, R. Kumar, J. Brumbaugh
National Institutes of Health, Bethesda, MD
Filed 26 Apr 90 17p
PAT-APPL-7-484 573 Available from NTIS: price code N03
The objects of the invention are: to provide a method for detecting an amplified DNA sequence without the use of a radioactive probe; and to provide a method for detecting an amplified DNA sequence in real time.

0756 Method for the Immune Capture and Detection of 'Borrelia burgdorferi' Antigens in Fluids and Tissues from Infected Ticks, Mice, Dogs and Humans, Test Kit Thereof, Purified Antigen of 'Borrelia burgdorferi' and Antibody Capable of Binding Therewith
D. W. Dorward, T. G. Schwan, C. F. Garon
National Institutes of Health, Bethesda, MD
Filed 27 Feb 90 53p
PAT-APPL-7-485 551 Available from NTIS: price code N03
The invention relates to novel antigens associated with Borrelia burgdorferi which are exported (or shed) in vivo and whose detection is a means of diagnosing Lyme disease. The antigens are extracellular membrane vesicles and other bioproducts including the major extracellular protein. Another object of the invention is to provide antibodies, monoclonal and/or polyclonal, labeled and/or unlabeled, that are raised against the antigens. A further object of the invention is to provide a method of diagnosing Lyme disease by detecting the antigens in a biological sample taken from a host using the antibodies in conventional immunoassay formats. Another object of the invention is to provide kits, for the diagnosis of Lyme disease, comprising the antibodies and ancillary reagents.

0757 Method for the Treatment of Cancer by Use of the Copper Complex of S-(Methylthio)-DL-Homocysteine
M. Rabinovitz, J. M. Fisher
National Institutes of Health, Bethesda, MD
Filed 27 Feb 89 27p
PAT-APPL-7-315 911 Available from NTIS: price code N03
The mixed disulfide of methyl mercaptan and L-homocysteine, S-(methylthio)-L-homocysteine (L-SMETH), inhibits the growth of L-1210 leukemia cells in culture at micromolar concentrations. The inhibition is markedly promoted by added cupric ion, but not by ions of other metals, is stereospecific, and is competitive with glutamine. The inhibition is also completely relieved by cytidine in non-competitive manner, but not by guanosine or uridine, indicating that the principal damage to the cellular economy resides in the amination of uridine to cytidine. This was confirmed by HPLC analysis of cell extracts, which showed a marked decrease in CTP with increases in the levels of UTP, GTP, and ATP. A major swelling of cells leading to lysis accompanies the inhibition and increases in DNA and protein per cell confirms this unbalanced growth.

0758 Method for the Treatment of Dopaminergic Neurodegenerative Disorders
R. J. Weber, R. J. Plunkett, S. E. Ewing
Department of Health and Human Services, Washington, DC
Filed 31 Aug 89 13p
PAT-APPL-7-401 141 Available from NTIS: price code N03
The present invention is directed to a method for the treatment of neurodegenerative disorders which affect the dopaminergic system by implanting into the brain of a host in need thereof an anti-neurodegenerative effective amount of activated leukocytes.

Method of Preventing Graft Rejection in Solid Organ Transplantation
See 0664

0759 Method of Recycling Dosimeters
C. L. Christianson
Department of the Navy, Washington, DC
Filed 10 Apr 90 14p
PAT-APPL-7-511 127 Available from NTIS: price code N03
This invention relates to the salvaging of used and or defective dosimeters for subsequent reliable use. Dosimeters are now often discarded after extended use by personnel or exposure to significant doses of gamma radiation. Such personnel dosimeters also become damaged and unreliable after long storage periods so as to provide distorted readings varying between zero and excessively high dose reading values following either no exposure to gamma radiation or moderate exposure. Presently available procedures of pre-dose screening and/or light detergent washing of the dosimeters inadequately deal with such reading reliability problems. In so far as prolonged storage is concerned, dosimeter damage often occurs as a result of humid environmental conditions. Moisture condensation on the exposed faces of the dosimeter sensing elements causes chemical and physical changes. Thus, surface projection growths and pitting occurs as a result of such chemical changes to optically affect the sensing operation of the dosimeters after ultra-violet irradiation to induce emissions indicative of prior exposure to gamma radiation. Distortion of readings indicative of such gamma radiation exposure accordingly results from the referred to humidity caused surface degradation damage. Keywords: Patent applications.

0760 Method of Synthesizing Double-Stranded DNA Molecules
D. Jones
National Institutes of Health, Bethesda, MD
Filed 8 Nov 89 58p
PAT-APPL-7-432 993 Available from NTIS: price code N03
The invention relates to a method in which the polymerase chain reaction (PCR) is used to generate products that when combined, denatured, and reannealed, form double-stranded DNA with discrete, cohesive, single-stranded ends. Such cohesive ends can be utilized in the formation of precise, directional DNA joints without dependence on enzyme restriction sites. Furthermore, the placement of cohesive single strands on both ends of a DNA molecule permits a DNA strand or strands to be annealed to form circular DNA. These recombinant circles of DNA can be directly transfected into appropriate host cells. The method of generating recombinant circles upon reannealing PCR generat-

ed products simplifies DNA mutagenesis, recombination, and cloning.

Method of Treating Diseases Associated with Elevated Levels of Interleukin 1
See 0665

Method of Treating Ocular Diseases by Periocular Administration of Cyclosporine A or G
See 0666

Methods for Inhibiting Rust Infections of Plants
See 0021

0761 Methods of High Frequency Tissue Regeneration, Regeneration of Herbicide-Tolerant 'Populus' Plants Therewith, and the Herbicide-Tolerant Plants Made Thereby
C. H. Michler, B. F. Haissig
North Central Forest Experiment Station, Rhinelander, WI. Forestry Sciences Lab
Filed 7 Dec 89 40p
PAT-APPL-7-447 458 Available from NTIS: price code N03

The object of the invention is to provide processes for in vitro culturing of tree tissue which achieve a high frequency of tissue regeneration from explants capable of generating adventitious or axillary buds in culture. Other objects of the invention are to provide high frequency in vitro tissue regeneration processes for production of somaclonal variants which processes are much more rapid in time compared with traditional tree breeding techniques thus making possible the development of traits difficult or impossible to obtain by traditional crossbreeding; to provide high frequency in vitro tissue regeneration processes capable of regenerating adventitious tissue from many different cell sources within a plant, including cells from plant parts not usually likely to create a new plant; and to provide in vitro culture processes combining high frequency tissue regeneration with in vitro exposure to toxic chemicals.

0762 Microbial Detoxification of Jojoba Toxins
T. P. Abbott, L. K. Nakamura
Agricultural Research Service, Washington, DC
Filed 26 Jul 90 13p
PAT-APPL-7-557 827 Available from NTIS: price code N03

A fungal strain of Fusarium moniliforme capable of degrading cyanogenic compounds has been discovered which is especially effective in detoxifying toxic substrates through degradation of conjugated organonitriles in the substrates. The objects of the invention are: to provide a new microorganism that can be artificially mass-produced and formulated for degrading cyanogenic compounds; to detoxify jojoba meal through degradation of simmondsin and related conjugated organonitriles in the meal including demethyl simmondsin, didemethylsimmondsin, and simmondsin ferulate; to convert toxic agricultural waste material into a safe, nutritious animal feed; and to treat industrial waste material for the degradation of toxic organonitriles.

0763 Microbial Production of a Novel Compound, 7,10-Dihydroxy-8-octadecenoic Acid from Oleic Acid
C. T. Hou, M. O. Bagby
Department of Agriculture, Washington, DC
Filed 21 Mar 90 15p
PAT-APPL-7-496 577 Available from NTIS: price code N03

The objects of the invention are: to introduce DOD as a novel chemical compound having potential utility as a plasticizer and as a source of intermediate compounds in the synthesis of specialty chemicals; to provide a method for producing DOD by microbial fermentation; to provide a new microorganism that can convert oleic acid to DOD; and to provide a potential industrial chemical that is generated from natural renewable resources.

0764 Molecular Clones of Bovine Immunodeficiency-Like Virus and Applications Thereof
M. Gonda
Department of Health and Human Services, Washington, DC
Filed 18 Sep 89 65p
PAT-APPL-7-408 815 Available from NTIS: price code N03

Biologically active proviral molecular clones of bovine immunodeficiency-like virus and cell lines infected with the same have been prepared. Various utilities of the clones are described.

0765 Molluscicidal beta-Carboline Carboxylic Acids and Methods Using the Same
R. D. Hagin, S. J. Bobnick
Agricultural Research Service, Washington, DC
Filed 21 Dec 89 26p
PAT-APPL-7-454 491 Available from NTIS: price code N03

The invention relates to the use of beta-carboline carboxylic acids, more specifically, 6-hydroxy-1,2,3,4-tetrahydro-beta-carboline-3-carboxylic acid and its analogs, as molluscicides. The compounds effectively control slug population in minimum or no-tillage methods of crop production.

0766 Monoclonal Antibodies for Identification and Preparation of raf-1 Oncoprotein
U. Radd
National Institutes of Health, Bethesda, MD
Filed 1 Jun 90 26p
PAT-APPL-7-531 950 Available from NTIS: price code N03

The objects of the invention are: to isolate substantially pure raf-1 vertebrate oncoprotein; to provide monoclonal antibody reagents that can immunoprecipitate and blot raf-1 proteins from vertebrates; and to provide a method for detecting the presence of raf-1 oncoprotein in clinical specimens or samples.

0767 Monoclonal Antibodies to Crystal Protein of 'Bacillus thuringiensis' Subspecies 'Israelensis'
K. B. Temeyer, M. Haufler, J. H. Pruett
Department of Agriculture, Washington, DC
Filed 18 May 87, patented 31 Jul 90 2p
PATENT-4 945 057 Available from Comm. of Patents

Murine hybridomas are disclosed which were constructed by fusing spleen cells from BALB/c mice immunized with soluble crystal protein from Bacillus thuringiensis subsp. israelensis (B.t.i.) to the murine myeloma cell line SP2/0-AG14. An ELISA (enzyme-linked immunosorbent assay) method for detection of antibodies specific for crystal protein of B.t.i. was modified to produce 100- to 1000-fold increased sensitivity and was used to identify hybridomas secreting monoclonal antibody specific for the B.t.i. crystal protein. Analysis of the hybridoma culture supernatant fluid indicated production of monoclonal IgG3 antibodies, specific for the 68,000 dalton protein presumed to be the insecticidal delta-endotoxin of B.t.i.

0768 Monoclonal Antibodies to Segments of HIV-1 (Human Immunodeficiency Virus) Reverse Transcriptase
S. H. Hughes, A. Hizi, S. D. Showalter, A. L. Ferris
National Cancer Inst., Bethesda, MD
Filed 5 Oct 89 40p
PAT-APPL-7-416 672 Available from NTIS: price code N03
The present invention was wholly or partially made using funds provided by the National Cancer Institute, National Institutes of Health, Department of Human Health and Services. Accordingly, the United States Government has certain rights to the invention. The invention concerns hybridomas which produce monoclonal antibodies recognizing particular segments of HIV-1 reverse transcriptase. These monoclonal antibodies are useful in diagnosis of Acquired Immune Deficiency Syndrome

0769 Monoclonal Antibody against Complement Regulatory Protein, sgp 120
M. Basta, C. Hammer, M. Frank
Department of Health and Human Services, Washington, DC
Filed 14 Jun 89 16p
PAT-APPL-7-365 772 Available from NTIS: price code N03
Monoclonal antibodies against complement regulatory protein sgp 120 are provided.

Monoclonal Antibody Immunoassay Kit for Avian REV
See 0023

0770 More Virulent Biotype Isolated from Wild-Type Virus
M. Shapiro, D. E. Lynn, E. M. Dougherty
Department of Agriculture, Washington, DC
Filed 30 Jun 89 20p
PAT-APPL-7-373 977 Available from NTIS: price code N03
A method has been found to select the most virulent biotypes from a wild-type entomopathogenic virus by selection of desirable characteristics after serial passages through in vivo and in vitro systems. Using this method, a strain of Lymantria dispar NPV virus was isolated which had increased biological activity and increased speed of kill.

0771 Neutralizing Monoclonal Antibody to Human Platelet Derived Growth Factor Hetero- and Homo-Dimers
W. La Rochelle, K. Robbins, S. Aronson
Department of Health and Human Services, Washington, DC
Filed 14 Jun 89 36p
PAT-APPL-7-365 715 Available from NTIS: price code N03
Neutralizing monoclonal antibody sis 1 to human platelet derived growth factor AB heterodimer, BB homodimer and v-sis gene product are provided. Antagonists, agonists and antiidiotypic antibodies derived from the monoclonal antibody of the present invention are described.

New Class of Lubricants Derived from Archaebacterial Lipids
See 0615

0772 New Member of the Nuclear Hormone Receptor Superfamily and cDNA Clone Thereof
K. Ozato
National Institutes of Health, Bethesda, MD
Filed 13 Dec 89 25p
PAT-APPL-7-450 162 Available from NTIS: price code N03
The object of the invention is to provide an isolated, substantially pure protein that binds specifically with region II of the CRE and is without binding affinity for other regions of the CRE. This protein is designated as H2RIIBP. Other objects of the invention are to provide a cDNA clone that encodes H2RIIBP and to provide an assay for the diagnosis or prognosis of hormone treatment of certain cancers utilizing the H2RIIBP.

New Method for Treating Immunodeficiency or Neutropenia
See 0668

0773 New Techniques for Producing Cite Directed Mutagenesis of Cloned DNA
S. Feinstone, C. Wychowski, J. Silver, S. Emerson
National Inst. of Allergy and Infectious Diseases, Bethesda, MD. Infectious Disease Committee
Filed 3 Apr 89 11p
PAT-APPL-7-332 616 Available from NTIS: price code N03
The new method of the invention that has been developed enables the construction of chimeric viruses with relatively large inserts and without regard to the restriction enzyme sites or other considerations of viral genomic sequence. The invention provides a method by which new cDNA fragments may be introduced into or substituted for cDNA in any chosen position within cloned DNA without regard to the position of specific restriction enzyme sites or any other specific sequence requirements.

Nitroxides as Protectors against Oxidative Stress
See 0669

0774 Non-Infectious Mutant Clone of HIV
M. A. Martin, R. Willey
Department of Health and Human Services, Washington, DC
Filed 14 Sep 87, patented 5 Jun 90 2p
PATENT-4 931 393 Available from Comm. of Patents
The invention is related to providing a non-infectious molecular clone of a mutant HIV and HIV proteins useful as immunogens and reagents for diagnostic kit.

Novel Antioxidant in Humans, Composition Thereof and Method of Treating Oxidant Related Disorders
See 0670

0775 Novel Compositions and Process for Inhibiting Digestion in Blood-Sucking Insects
D. Borovsky, D. Carlson
Agricultural Research Service, Washington, DC
Filed 7 Apr 89 16p
PAT-APPL-7-335 169 Available from NTIS: price code N03
The invention concerns novel peptide hormones that inhibit digestion in blood-ingesting insects, thus causing sterility (inhibition of egg development) in the treated insects. All three compounds show potent biological activity against Aedes aegypti, Culex quinquefasciatus, Anopheles albimanus, Anopheles quadrimaculatus, Lutzomyia anthophora, Culicoides variipennis, Stomoxys calcitrans, Musca domestica and Ctenocephalides felis. The compounds are white

powders that are highly soluble in water. They can be synthesized on a commercial peptide synthesizer. Also included in the invention are addition salts, complexes, or prodrugs such as esters of the compounds of the invention, especially the nontoxic pharmaceutically or agriculturally acceptable acid addition salts.

0776 Novel Lymphokine/Cytokine Genes
U. Siebenlist, W. J. Leonard, P. J. Zipfel, S. G. Irving, K. Kelly
Department of Health and Human Services, Washington, DC
Filed 16 Dec 88 184p
PAT-APPL-7-312 001 Available from NTIS: price code N03
The invention relates to DNA segments which encode mRNAs and/or proteins having structural and/or functional characteristics of such molecules related to lymphokines/cytokines that are inducible in T cells. In the practice of one embodiment of the invention, these DNA segments are capable of being expressed in suitable host cells, thereby producing lymphokine-like or cytokine-like proteins. The invention also relates to mRNAs produced as the result of transcription of the sense strands of the DNA segments of the invention. The invention further comprises novel bioassay methods for determining effects of various mitogenic agents on expression in human cells of the mRNAs and proteins produced from the genes related to DNA segments of the invention.

0777 Novel Method for Amplifying Unknown Nucleic Acid Sequences
J. Silver
National Institutes of Health, Bethesda, MD
Filed 21 Dec 89 12p
PAT-APPL-7-454 171 Available from NTIS: price code N03
An object of the invention is to provide a method for amplifying nucleic acid fragments without prior knowledge of their sequence provided only that the nucleic acid can be purified in advance. Another object of the invention is to amplify nucleic acids from virus particles present in minute amounts in biological samples, without first knowing the sequence of any such virus, thereby facilitating diagnosis of viral infection and identification of a particular virus; and to provide a method for amplifying and cloning new viruses, thereby facilitating their discovery. In genetics, the technique could be used to amplify nucleic acid fragments obtained in minute amounts from particular chromosome locations by microchromosome dissection.

0778 Novel Monoclonal Antibody against Human Platelets
H. Gralnick
National Institutes of Health, Bethesda, MD
Filed 3 Nov 89 21p
PAT-APPL-7-432 380 Available from NTIS: price code N03
The production of a monoclonal antibody against human platelets is described in the invention. Unique features of the described monoclonal antibody are that it belongs to the IgG1 subclass; it binds only to activated platelets, recognizing a 148,000 kilodalton membrane protein; it has no effect on nonactivated platelets; and it enhances fibrinogen, Von Willebrand factor and fibronectin binding to the platelet surface, without affecting thrombospondin binding.

0779 Novel Proteins and Cloned Genes for Diagnosis and Prophylaxis of Babesiosis
T. F. McElwain, S. A. Hines, T. C. McGuire, G. H. Palmer, D. P. Jasmer
Agricultural Research Service, Washington, DC
Filed 4 Apr 89 37p
PAT-APPL-7-333 155 Available from NTIS: price code N03
Novel merozoite proteins of Babesia bovis are disclosed and claimed here. These proteins are known to be expressed on the surface of the merozoite and may be used to raise neutralizing antibodies. Thus, they can be used in the formulation of subunit vaccines for the prophylaxis of bovine babesiosis. Several of the proteins described here raise antibodies to both Babesia bovis and Babesia bigemina, while others are species, or even isolate, specific. Also disclosed are monoclonal antibodies to bovine babesiosis antigens. These monoclonal antibodies are used to identify merozoite surface antigens and may be used in the treatment and/or diagnosis of bovine babesiosis. A further element of the invention is the identification of genes which code for Babesia proteins. These genes can be used to make recombinant proteins which can be utilized for vaccines. The invention also provides a means of detecting the presence of disease-causing Babesia organisms. The detection method involves the use of DNA probes which selectively identify the presence of these organisms.

0780 Novel Receptor for Pathogenic Fungi
V. Jimenez
National Institutes of Health, Bethesda, MD
Filed 30 Jan 90 27p
PAT-APPL-7-472 128 Available from NTIS: price code N03
The objects of the invention are to identify specific epitopes and/or receptors to which pathogenic fungi bind; to provide synthetic analogues that inhibit yeast adhesion to host tissues; to provide a method for preventing infection and/or disease caused by pathogenic fungi; to provide a method for isolating purified components from the yeast cell that mediate yeast attachment to host cells; to provide a kit for detecting the presence of pathogenic fungi; and to provide a composition comprising an effective amount of the fungal receptor for preventing or treating diseases caused by fungal infection, and a pharmaceutically acceptable carrier.

0781 Novel Restriction Endonuclease
W. J. Leonard, B. Wolf, N. F. Halden
Department of Health and Human Services, Washington, DC
Filed 21 Oct 88, patented 19 Jun 90 2p
PATENT-4 935 367 Available from Comm. of Patents
A new restriction enzyme, Mfe I, has been discovered. Mfe I recognizes the sequence CAATTG and cuts at the recognition sequence C'AATTG and generates compatible cohesive ends with EcoRI cleaved fragments. Various utilities of the enzyme have been described.

0782 Novel System for Isolating and Producing New Genes, Gene Products and DNA Sequences
M. Resnick
National Institutes of Health, Bethesda, MD
Filed 27 Dec 89 17p
PAT-APPL-7-457 557 Available from NTIS: price code N03
The objects of the invention are: to provide an intramolecular in vitro scheme for interaction between homologous as well as divergent DNA sequences; to provide a rapid and

simple in vitro molecular system for isolating DNA sequences related to a known DNA sequence or a DNA sequence of relatively low homology from unknown libraries of DNA and for the cloning of such sequences; and to generate new and novel genes, gene products and DNA sequences.

0783 O(sup 6)-Substituted Guanine Compounds and Methods for Depleting O(sup 6)-Alkylguanine DNA Alkytransferase Levels
R. C. Moschel, E. E. Dolan, A. E. Pegg
National Institutes of Health, Bethesda, MD
Filed 13 Mar 90 29p
PAT-APPL-7-492 468 Available from NTIS: price code A03
The objects of the present are: invention to provide novel compounds useful for effectively reducing AGT levels in tumor cells; to provide pharmaceutical compositions containing compounds which effectively reduce AGT levels in cells; to provide methods for depleting AGT levels in tumor cells; and to provide methods for increasing host responsiveness to anti-neoplastic chloroethylating agents or other alkylating agents by administering to the host compositions containing compounds which deplete AGT levels in the tumor cells in the host.

Oat Soluble Dietary Fiber Compositions
See 0025

0784 Oligonucleotide Probes Complementary to 'Treponema hyodysenteriae' RNA Sequences
N. S. Jensen, T. B. Stanton, T. A. Casey
Agricultural Research Service, Washington, DC
Filed 21 Mar 90 21p
PAT-APPL-7-496 579 Available from NTIS: price code N03
The objects of the invention are: to provide a rapid and effective alternative to bacteriological culture for diagnosis of swine dysentery; to provide an oligonucleotide probe useful for clinical diagnosis of swine dysentery that is characterized by a high degree of specificity and selectivity for T. hyo; to identify infected swine, including those which are asymptomatic and shedding T. hyo in their feces; to enable monitoring the spread of swine dysentery throughout a herd; and to provide a tool for identifying different strains of T. hyo.

0785 Organic Nitriles as Insect Antifeedants
R. G. Powell, K. L. Mikolajczak, B. W. Zilkowski, J. Clardy, E. K. Mantus
Department of Agriculture, Washington, DC
Filed 27 Jun 89 39p
PAT-APPL-7-371 879 Available from NTIS: price code N03
Members of a novel class of organic nitriles related to an indole alkaloid of Dithyrea wislizenii (Cruciferae) have been discovered to be potent feeding inhibitors of the fall armyworm and European corn borer.

0786 Peptide Derivatives of Cytochrome b (sub 558) and Their Use as Medicaments
H. L. Malech, D. Rotrosen
Department of Health and Human Services, Washington, DC
Filed 24 May 90 28p
PAT-APPL-7-527 767 Available from NTIS: price code N03
The invention relates to peptide derivatives having six and seven amino acid peptide sequences with inhibitory activity on the enzyme systems involved in the oxidative burst of human phagocytic cells. More specifically, the invention relates to peptide derivatives comprising a limited number of carboxyl-terminal amino acids of human cytochrome b(558) which appear to inhibit activation of the respiratory burst of human phagocytic cells, i.e. neutrophils, eosinophils and monocytes. The peptide derivatives are foreseen to be used in medicaments for mammals, including humans, in the treatment of inflammatory diseases.

0787 Pheromone Compositions and Methods for Attracting 'Euschistus' sp. Insects
J. R. Aldrich, M. P. Hoffman, J. P. Kochansky, W. R. Lusby, L. T. Wilson
Agricultural Research Service, Washington, DC
Filed 8 Jan 90 23p
PAT-APPL-7-461 890 Available from NTIS: price code N03
A chemical attractant pheromone for Euschistus species as well as methods for concentrating and destroying these pests is provided. In one alternative embodiment the attractant could be used to monitor area levels of these pests. In another embodiment the attractant would be useful for concentrating these pests in early maturing 'trap-crops' where they could be economically destroyed by limited insecticide application. Analogously, this chemical attractant could be applied to artificially create overwintering aggregations of adults that would then be destroyed, thus preventing spring outbreaks.

0788 Plant Patent
S. P. Wells
Forest Service, Washington, DC
Filed 20 Apr 89 10p
PAT-APPL-7-341 088 Available from NTIS: price code N03
A new and distinct variety of Pseudotsuga menziesii, a Douglas-fir seedling with an unusually twisted growth pattern, has been found and sexually reproduced.

Plant Transformation by Gene Transfer into Pollen
See 0027

0789 Plaque-Inhibiting Protein from Bacteroides Loeschei and Methods for Using the Same
J. London
National Institutes of Health, Bethesda, MD
Filed 30 Apr 90 28p
PAT-APPL-7-516 463 Available from NTIS: price code N03
The invention relates to a surface protein from Bacteroides loeschei which is an adhesin useful in preventing plaque formation in the oral cavity. More specifically, the invention relates to a purified, characterized adhesin isolated from B. loeschei and its use in a method for preventing or retarding the formation of plaque in the oral cavity as well as other uses based on the binding capabilities of the adhesin.

0790 Plastic Bait Composition for Attracting and Killing Crop Pests
G. H. McKibben, J. C. Dickens, J. W. Smith
Agricultural Research Service, Washington, DC
Filed 2 Feb 90 16p
PAT-APPL-7-473 757 Available from NTIS: price code A03
The invention relates to compositions, apparatus and methods for attracting and killing or destroying chewing pests such as armyworm, boll weevil, boll worm, loopers, cutworms and the larvae and adults of many other lepto-dopterous and coleopterous pests. Surprisingly, it was

found that insects can be encouraged to feed on a polymer based insecticide composition impervious to environmental conditions. Various forms of the invention are described, including solid pellets and hollow tubes that can be filled with any bait mixture. In one form of the invention, a plastisol is prepared from PVC powder with crude cottonseed oil as the plasticizer. Pellets are prepared by dip molding. The cottonseed oil contains both attractants and feeding stimulants for boll weevils and also functions uniquely as an integral part of the PVC matrix.

0791 Prevention of the Acute Cytotoxicity Associated with Silica Containing Minerals
V. Vallyathan, V. Castranova, N. S. Dalal, K. Van Dyke
Department of Health and Human Services, Washington, DC
Filed 30 Oct 89 28p
PAT-APPL-7-429 033 Available from NTIS: price code N03
The inventors have developed a method which may prevent the acute cytotoxicity of freshly fractured silica and silica containing minerals including asbestos and coal mine dust containing silica. The method entails coating silica containing minerals, including coal, with a monomolecular film of an aqueously compatible silane coupling agent, either during milling, processing or after grinding or fracturing of silica or silica containing materials. The invention also provides for a method of preventing certain pulmonary diseases, have been considered as occupational hazards in certain professions, such as coal mining and any other profession where persons are subjected to the inhalation of small particles of freshly fractured or ground silica containing minerals.

0792 Process for Detecting Genetic Susceptibility to Cancer
K. K. Sanford, R. Parshad, G. M. Jones
Department of Health and Human Services, Washington, DC
Filed 14 Nov 88 38p
PAT-APPL-7-270 030 Available from NTIS: price code A03
A process for determining genetic susceptibility to cancer is disclosed in which the frequency of chromatid breaks and gaps is calculated in metaphase skin fibroblasts or stimulated peripheral blood lymphocytes after x-irradiation or fluorescent light exposure. Susceptibility to cancer is found when the frequency of breaks and gaps in the cell sample is two to three-fold higher than that occuring in comparable cells from control individuals. Various factors have been found which influence the accuracy of the test results. These factors include pH, temperature, cell density, culture medium or serum, microbial contamination and visible light exposure (effective wavelength 500 nm). Additionally, because of experimental variability, known normal controls are suggested for use in each test group.

0793 Process for Detecting Genetic Susceptibility to Cancer
K. K. Sanford, P. Parshad, G. M. Jones
Department of Health and Human Services, Washington, DC
Filed 14 Nov 88, patented 12 Jun 90 17p
PATENT-4 933 274 Available from Comm. of Patents
A process for determining genetic susceptibility to cancer is disclosed in which the frequency of chromatid breaks and gaps is calculated in metaphase skin fibroblasts or stimulated peripheral blood lymphocytes after x-irradiation or fluorescent light exposure. Susceptibility to cancer is found when the frequency of breaks and gaps in the cell sample is two to three-fold higher than that occurring in comparable cells from control individuals. Various factors have been found which influence the accuracy of the test results. These factors include pH, temperature, cell density, culture medium or serum, microbial contamination and visible light exposure (effective wavelength 500 nm). Additionally, because of experimental variability, known normal controls are suggested for use in each test group.

0794 Process for the Purification of Cl-Inhibitor
Y. M. Pilatte, C. H. Hammer, M. M. Frank, L. F. Fries
National Institutes of Health, Bethesda, MD
Filed 10 Jul 89 30p
PAT-APPL-7-377 334 Available from NTIS: price code N03
The invention refers to the finding that it is possible to isolate C1-Inh in purified form from blood plasma in a process which comprises the steps of: (i) removal of interfering major serum proteins; (ii) subjecting the purified material to chromatography on jacalin-agarose; (iii) subjecting the C1-Inh-comprising eluate from (ii) to hydrophobic interaction chromatography; and (iv) isolating the eluate comprising the purified C1-Inh. Another aspect of the invention is related to a method for purifying and characterizing the low molecular weight forms of C1-Inh by utilizing the process as described above.

Production of Fructan (Levan) Polyfructose Polymers Using 'Bacillus polymyxa'
See 0095

0795 Production of Human T-Cell Leukemia (Lymphotropic) Retrovirus (HTLV-1) Envelope Protein Fragments in Bacterial and Use in Seroepidemiological Studies
T. S. Papas, K. Samuel, J. S. Lautenberger, F. Wong-Stall
National Institutes of Health, Bethesda, MD
Filed 26 Nov 87 14p
PAT-APPL-7-126 007 Available from NTIS: price code N03
The proteins of the invention are useful as diagnostic tools and, when used as immunogens, will elicit production of antibodies which are reactive with the native virus. The method of the invention was applied using two DNA fragments from human T-cell leukemia virus subgroup I (HTLV-I) envelope gene. The fragments were inserted into pJLA16 plasmids using polynucleotide linkers. These plasmids containing either of the DNA fragments were introduced into E. coli. The MZ1 strain of E. coli which contains a temperature-sensative repressor was used as a preferred bacteria. The protein-containing fractions obtained from a lysate of the induced MZ1 cells were recognized by antibodies in sera from HTLV-I infected patients.

0796 Production of Monoclonal Antibodies to Treponema Denticola by Hybridoma TDII, IAA11
L. G. Simonson
Department of the Navy, Washington, DC
Filed 22 May 89 26p
PAT-APPL-7-356 044 Available from NTIS: price code N03
It has been found that the fusion of a mouse myeloma cell line with a mouse lymphocyte creates a hybridoma cell line which produces a uniquely active monoclonal antibody. This antibody is uniquely specific for bacterial epitopes associated with the species Treponema denticola. The

uniquely active monoclonal antibody of theis invention may be included in diagnostic reagents and methods used to detect the oral anaerobe Treponema denticola. Keywords: Patent applications.

0797 Production of Monoclonal Antibodies to Treponema Denticola by Hybridoma TDIII, IIIBB2
L. G. Simonson
Department of the Navy, Washington, DC
Filed 22 May 89 25p
PAT-APPL-7-055 575 Available from NTIS: price code N03
A monoclonal antibody is disclosed which is reactive to Treponema denticola and produced by the hybridoma deposited under ATCC HB 9967. The invention also discloses diagnostic reagents and methods for detecting Treponema denticola utilizing the hybridoma deposited under ATCC HB 9967. Patent applications.

Pseudorabies Diagnosis Probes
See 0029

0798 Purification and Characterization of a Novel Monocyte Chemotactic and Activating Factor Produced by a Human Myelomonocytic Cell Line
K. Matsushima, C. G. Larsen, G. Du Bois, J. J. Oppenheim
National Institutes of Health, Bethesda, MD
Filed 16 Feb 89 14p
PAT-APPL-7-311 048 Available from NTIS: price code N03
A lymphokine having analogous chemotactic properties for neutrophils has also been identified, purified and cloned from lipopolysaccharide (LPS)-stimulated human monocytes. The compound has been designated NCF and is deemed to be a novel neutrophil chemotactic factor. In working with NCF, it has been determined that there exists in LPS-stimulated human monocyte conditioned media, a second chemotactic activity, specific for monocytes, but distinct in molecular weight (MW) from NCF. In view of this, the present inventors sought to identify and purify this unknown composition.

0799 Rapid and Sensitive Test for Detecting Hepatitis A Virus
B. Robertson
National Institutes of Health, Bethesda, MD
Filed 24 Jan 90 28p
PAT-APPL-7-469 143 Available from NTIS: price code N03
The object of the invention is to provide a rapid, sensitive and specific test for detecting the presence of HAV in infected or contaminated samples.

0800 Rapid, Versatile and Simple System for Expressing Genes in Eukaryotic Cells
B. Moss, T. Fuerst, O. Elroy-Stein
Department of Health and Human Services, Washington, DC
Filed 7 Jul 89 26p
PAT-APPL-7-376 687 Available from NTIS: price code N03
An efficient, versatile and simple expression system which confers cap-independent translation to prokaryotic RNA's in eukaryotic cells has been described. The utility of recombinant vaccinia virus for this purpose has been illustrated.

0801 Reagents for Detecting SIV (Simian Immunodeficiency Viruses) and HIV-2 (Human Immunodeficiency Viruses-2)
L. Henderson, R. Sowder, R. Benveniste, T. Copeland, S. Oroszian
Department of Health and Human Services, Washington, DC
Filed 3 Jul 89 20p
PAT-APPL-7-375 535 Available from NTIS: price code N03
Substantially pure peptides characteristic of simian immunodeficiency virus and antibodies thereto, useful as diagnostic reagents, are described.

0802 Real-Time Monitoring of Oxidative Products from In vitro Cell-Biomaterial Interaction Using Chemiluminescence
D. S. Kaplan, G. L. Picciolo, E. P. Mueller
Department of Health and Human Services, Washington, DC
Filed 21 Sep 89 41p
PAT-APPL-7-410 626 Available from NTIS: price code N03
The invention relates to a method for monitoring the generation of oxidative products from cell-biomaterial interactions. More specifically, the present invention relates to a chemiluminescence method for continuously monitoring in real time the generation of oxidative products from cell-biomaterial interactions in vitro.

0803 Resiniferatoxin and Analogues Thereof to Cause Sensory Afferent C-Fiber and Thermoregulatory Desensitization
P. M. Blumberg
Department of Health and Human Services, Washington, DC
Filed 24 Oct 88, patented 3 Jul 90 2p
PATENT-4 939 149 Available from Comm. of Patents
The invention relates to a method for desensitizing a subject animal, which comprises administering to the subject animal a therapeutically effective desensitizing amount of resiniferatoxin for desensitizing the subject animal to neurogenic inflammation, to chemically and thermally induced pain and to responses involving sensory afferent pathways sensitive to capsaicin and to responses involving the hypothalamic temperature control region, and a pharmaceutically acceptable carrier therefor.

Revertant Serotype 1 Marek's Disease Vaccine
See 0030

0804 Rickettsia Rickettsii Surface Protein Gene
R. D. Gilmore, N. Joste, G. A. McDonald
National Institutes of Health, Bethesda, MD
Filed 11 Nov 89 21p
PAT-APPL-7-429 936 Available from NTIS: price code N03
The present invention provides a DNA segment encoding a Rickettsia rickettsii surface protein and the recombinant protein encoded therein, as well as providing a recombinant DNA molecule encoding a Rickettsia rickettsii protein, and a host cell stably transformed therewith. Another object of the invention is to provide a method for producing a Rickettsia rickettsii protein. The invention also provides a bioassay for diagnosis of Rocky Mountain spotted fever in patients and provides a vaccine for humans against Rocky Mountain spotted fever.

Scheiner-Principle Pocket Optometer for Self Evaluation and Bio-Feedback Accommodation Training
See 0640

0805 SCL (Stem Cell Leukemia) Gene, and a Hematopoietic Growth and Differentiation Factor Encoded Thereby
I. R. Kirsch, C. G. Begley
National Institutes of Health, Bethesda, MD
Filed 17 Nov 89 39p
PAT-APPL-7-437 819 Available from NTIS: price code N03

A new human gene, SCL, has been identified. The gene was discovered because of its involvement in a chromosomal translocation associated with the occurrence of a stem cell leukemia manifesting myeloid and lymphoid differentiation capabilities. The sequence of a cDNA for the normal SCL transcript is reported, as well as for an aberrant fusion transcript produced in the leukemic cells. Although different at their 3' untranslated regions, both cDNAs predict a protein within which is contained a region of primary amino acid sequence homology to the previously described amphipathic helix-loop-helix DNA binding and dimerization motif also contained within a variety of proteins whose role in development, differentiation, and proliferation has already been established.

0806 Selenate Removal from Waste Water
R. S. Oremland
Forest Service, Washington, DC
Filed 30 Oct 89 34p
PAT-APPL-7-428 699 Available from NTIS: price code N03

An efficient process for removing oxyanions of selenium by selenate-respiring microorganisms may be obtained according to the invention by reducing the nitrate concentration well below 1 mM. In the process according to the invention, the required lowering of the nitrate concentration in selenium- and nitrate- containing waste water may be accomplished by employing a nitrate utilizing biomass under aerobic conditions in a first treatment zone to remove nitrate. The efficiency of the process is further enhanced by seeding the treatment zone where the microbial respiratory removal of oxyanions of selenium from waste water takes place with a culture of microorganisms enriched for selenium respiring microorganisms. Additional improvement of the process according to the invention may be obtained by adapting the seed culture of microorganisms enriched for selenium respiring microorganisms to the chemical conditions.

0807 Self Moistening Composition for Deactivating Toxic Substances and Method of Use
R. E. Pellenbarg, H. W. Carhart
Department of the Navy, Washington, DC
Filed 31 Mar 88, patented 20 Feb 90 4p
PATENT-4 902 441 Available from Comm. of Patents

An self-moistening inactivating agent for toxic substances provided in a water-vapor-impervious container. The agent comprises an intimate admixture of at least one hygroscopic material and at least one oxidizing agent. The agent can also contain chelating materials and electrostatic materials. The agent is used to inactivate toxic substances on the ground or on contaminated surfaces. Particularly, the agent inactivates organophosphorous toxic agents. PAT-CL-252/187-26.

0808 Sensitive Diagnostic Test for Lyme Disease
R. Schwan
Department of Health and Human Services, Washington, DC
Filed 5 Jun 89 29p
PAT-APPL-7-361 850 Available from NTIS: price code N03

The nucleotide sequence of a recombinant clone containing a specific segment of Borrelia burgdorferi DNA which enables the identification of the spirochetes causing Lyme disease has been provided. A diagnostic kit containing oligonucleotide primers derived from this sequence, suitable for the detection of Borrelia burgdoferi in a PCR assay, as well as the cloned DNA of the present invention, allows the detection of Lyme disease with sensitivity and specificity not heretofore attained by any other test.

0809 Sensitive Method for Localizing Chromosomal Breakpoints
I. Magrath
National Institutes of Health, Bethesda, MD
Filed 24 Nov 89 16p
PAT-APPL-7-441 516 Available from NTIS: price code N03

An object of the invention is to provide a sensitive and efficient method for localizing chromosomal breakpoints by amplifying a fragment containing the breakpoint, making use of repeat sequences flanking one side of the breakpoint by the polymerase chain reaction (PCR). Repeat sequences of various kinds occur scattered throughout the genome and any of these may be used in the approach. In Burkitt's lymphoma, the breakpoint on chromosome 14 is often within a region containing many repeat sequences known as a 'heavy chain switch region', and it was, therefore chosen to use tumors with breakpoints in the region to demonstrate the feasibility of the approach. Another object of the invention is to provide a diagnostic tumor marker for Burkitt's lymphoma with 8;14 translocations, and a new method of simultaneously subdividing Burkitt's lymphoma into subtypes based on the location of chromosomal breakpoints.

0810 Sensitive Method for Measurement of Chimeric Transcripts of DNA Containing Translocations
S. Stevenson
Department of Health and Human Services, Washington, DC
Filed 2 Oct 89 14p
PAT-APPL-7-194 171 Available from NTIS: price code N03

The invention provides a sensitive, reliable and efficient method for detecting micro quantities of mRNA found in biological samples, such as biopsy specimens. It provides a diagnostic test for detecting and predicting the course of conditions resulting from t(14;18) translocation, such as follicular lymphoma, Hodgkins disease and the like.

0811 Sex Attractant for the Apple Ermine Moth
L. M. McDonough, H. G. Davis
Agricultural Research Service, Washington, DC
Filed 13 Jul 90 30p
PAT-APPL-7-552 387 Available from NTIS: price code A03

The invention relates to a novel composition and use thereof for insect control. More particularly, the invention relates to a composition of (Z)-11-tetradecen-1-ol and (Z)-9-dodecen-1-ol acetate and use of the composition as an attract-

ant, disruptant, and monitoring agent for the apple ermine moth.

0812 Simple Rapid Method for Gene Transfer
A. F. Cockburn, H. Meier
Agricultural Research Service, Washington, DC
Filed 30 Jan 90 11p
PAT-APPL-7-472 538 Available from NTIS: price code N03
The object of the present invention is to provide methods for gene transfer that reduce or eliminate cellular pretreatment steps, e.g., the removal of cell wall by chemical or enzymatic methods, is rapid and can be practiced without the need of additional expensive equipment. Cells, embryos or tissues selected for genetic manipulation are suspended in an Eppendorf tube in an aliquot of the desired genetic material to be transferred to which the resulting mixture is added and is agitated by vortexing from about 30 to about 90 seconds. The cells, embryos or tissue are sedimented and the DNA supernatant removed. After sedimentation, the injected material is resuspended in or on a growth medium to assay for expression.

Simple System for Decomposing Atrazine in Wastewater
See 0119

Slowly Dissociating (Tight Binding) Dopamine, Serotonin or Norepinephrine Reuptake Inhibitors as Cocaine, Amphetamine and Phencyclidine Antagonists
See 0674

Solid-State Photometer Circuit
See 0642

0813 Specific and Sensitive Diagnostic Test for Lyme Disease
W. Simpson
National Institutes of Health, Bethesda, MD
Filed 26 Oct 89 23p
PAT-APPL-7-427 735 Available from NTIS: price code N03
The object of the invention is to provide diagnostic DNA probes for detecting the presence of B. burgdorferi in a biological sample.

0814 Stable Mammalian Cell Line Expressing a Bacteriophage RNA Polymerase
O. Elroy-Stein, B. Moss
Department of Health and Human Services, Washington, DC
Filed 1 Mar 90 18p
PAT-APPL-7-485 871 Available from NTIS: price code N03
The invention represents a major improvement in the field and involves the construction of a stable mammalian cell line that expresses a foreign RNA polymerase gene. For transient expression assays, this cell line eliminates the requirement for the vaccinia virus containing the T7 RNA polymerase gene. This is important because vaccinia virus causes a cytopathic effect and is also a health hazard. Alternatively, the cell line can be infected with a single recombinant vaccinia virus containing the T7 promoter regulated foreign gene and dispense with the requirement for a second vaccinia virus containing the T7 RNA polymerase.

0815 Strip-Comb Dot Immunobinding Assay for Rapid Screening of Monoclonal Antibodies
S. Cheng
Department of Health and Human Services, Washington, DC
Filed 11 Oct 88 12p
PAT-APPL-7-255 759 Available from NTIS: price code A03
The invention describes a rapid strip-comb dot immunobinding system for screening large number of hybridomas. The method is easy and economical and requires no specialized equipment. The method is also versatile because it lends itself to a broad range of antigens which bind to nitrocellulose. Furthermore, by the use of an avidin-biotin-peroxidase system, the sensitivity of detection of the antibody or antigen is greatly enhanced.

Suramin and Active Analogues Thereof in the Treatment of Hypercalcemia
See 0677

System for Assessing Bee Temperament
See 0035

Target-Specific, Cytotoxic, Recombinant Pseudomonas Exotoxin
See 0678

0816 Three-Dimensional Coculture Process
D. A. Wolf, T. J. Goodwin
National Aeronautics and Space Administration, Houston, TX. Lyndon B. Johnson Space Center
Filed 2 Mar 89 27p
PAT-APPL-7-317 931 Available from NTIS: price code N03
The present invention relates to a 3-dimensional co-culture process, more particularly to methods or co-culturing at least two types of cells in a culture environment, either in space or in unit gravity, with minimum shear stress, freedom for 3-dimensional spatial orientation of the suspended particles and localization of particles with differing or similar sedimentation properties in a similar spatial region to form 3-dimensional tissue-like structures. Several examples of multicellular 3-dimensional experiences are included. The protocol and procedure are also set forth. The process allows simultaneous culture of multiple cell types and supporting substrates in a manner which does not disrupt the 3-dimensional spatial orientation of these components. The co-cultured cells cause a mutual induction effect which mimics the natural hormonal signals and cell interactions found in the intact organism. This causes the tissues to differentiate and form higher 3-dimensional structures such as glands, junctional complexes polypoid geometries, and microvilli which represent the corresponding in-vitro structures to a greater degree than when the cell types are cultured individually or by conventional processes. This process was clearly demonstrated for the case of two epithelial derived colon cancer lines, each co-cultured with normal human fibroblasts and with microcarrier bead substrates. The results clearly demonstrate increased 3-dimensional tissue-like structure and biochemical evidence of an increased differentiation state. With the present invention a variety of cells may be co-cultured to produce tissue which has 3-dimensionality and has some of the characteristics of in-vitro tissue. The process provides enhanced 3-dimensional tissue which create a multicellular organoid differentiation model.

0817 To Produce Foreign Protein in Milk of Transgenic Animals
W. H. Henninghausen
Department of Health and Human Services, Washington, DC
Filed 9 Apr 86 22p
PAT-APPL-6-849 815 Available from NTIS: price code N03
The invention features a DNA sequence containing a gene encoding a protein, the gene being under the transcriptional control of a mammalian milk protein promoter which does not naturally control the transcription of the gene, the DNA sequence further including DNA enabling secretion of the protein. The promoter can be that of a milk serum protein or a casein protein, although milk serum proteins are preferred. The invention permits the production of any desired protein in an easily maintained stable, portable culture system. Secretion of the protein into the host mammal's milk facilitates purification and obviates removal of blood products and culture media additives, some of which can be toxic or carcinogenic. More importantly, protein yields will be high and production will be more cost effective and efficient.

0818 Treatment or Diagnosis by Endoscopic Administration into the Lymphatics
J. L. Mulshine, J. Weinstein
Department of Health and Human Services, Washington, DC
Filed 17 Dec 88, patented 27 Mar 90 6p
PATENT-4 911 690 Available from Comm. of Patents
The present invention is a method for administration of therapeutic and diagnostic reagents whereby the reagent is administered trans-endoscopically to the lymphatic system. The method is more effective than intravenous injection as a means of delivering reagents to the lymph nodes. The delivery of reagents to the lymph nodes by injection into the nodes has now been shown to be of greater value than subcutaneous injection as a means of delivering reagents to the lymphatic tissue.

0819 Tumor Infiltrating Lymphocytes as a Treatment Modality for Human Cancer
S. A. Rosenberg
Department of Health and Human Services, Washington, DC
Filed 21 Aug 89 24p
PAT-APPL-7-396 528 Available from NTIS: price code N03
A new immunotherapeutic method of treating cancer with a combination of tumor infiltrating lymphocytes and IL-2 has been described.

0820 Tumor-Specific Molecules for Controlling Cancer
I. Magrath
National Institutes of Health, Bethesda, MD
Filed 13 Dec 89 24p
PAT-APPL-7-450 252 Available from NTIS: price code N03
An object of the invention is to provide antisense oligomers which selectively inhibit the growth and proliferation of tumor cells without affecting normal cell proliferation. Other objects of the invention are to provide a method of controlling cancer by contacting tumor cells with antisense molecules tailored on the basis of an identified genetic abnormality of the tumor cells targeted to be controlled; and to provide a rational method for designing tumor-specific antisense oligonucleotides.

0821 Type A Platelet-Derived Growth Factor Receptor Gene
T. Matsui, S. A. Aaronson, J. H. Pierce
National Cancer Inst., Bethesda, MD
Filed 9 Feb 89 90p
PAT-APPL-7-308 282 Available from NTIS: price code N03
The invention relates, in part, to DNA segments which encode messenger RNAs (mRNAs) and proteins having structural and/or functional characteristics of a new human receptor within the subfamily of membrane-spanning tyrosine kinase receptor genes. More specifically, the invention includes DNA segments containing a genomic DNA sequence or a DNA sequence complementary to the mRNA transcribed from said genomic DNA (i.e., a 'cDNA'), with a predicted protein product similar in structure to other receptors of this growth factor receptor subfamily. Further, the novel product encoded by DNAs of the invention is coexpressed with the known PDGF receptor gene product in a variety of normal cell types.

0822 Type I Transglutaminase DNA
A. M. Jetten, E. E. Floyd
Department of Health and Human Services, Washington, DC
Filed 24 Oct 89 22p
PAT-APPL-7-425 887 Available from NTIS: price code N03
The present invention is related to a DNA segment which encodes mammalian type I transglutaminase. It is also related to methods for isolating new members of the transglutaminase family and detection or identification of squamous cell carcinomas.

Use of Arsenite to Reversibly Block Steroid Binding to Glucocorticoid Receptors in the Presence of Other Steroid Receptors
See 0680

Use of Native 'Aspergillus flavus' Strains to Prevent Aflatoxin Contamination
See 0036

0823 Use of Visible Light for Treatment of Patients with HIV Infection
N. Rosenthal, T. Wehr
National Institutes of Health, Bethesda, MD
Filed 1 Jun 90 8p
PAT-APPL-7-531 674 Available from NTIS: price code N03
The invention provides a way to improve the immune system by ameliorating the effects of helper T-cell destruction caused by HIV infection or other agents which suppress or harm helper T-cells. In accordance with the invention, the patient is exposed to visible light for a period of time, which increases either the total T-cells, total helper T-cells, the helper T-cell percentage or the ratio of helper:suppressor T-cells. The light is preferably bright, generally in the intensity range of about 1,000 to about 10,000 lux. This intensity is much brighter than normal indoor light. The light is preferably directed into the eyes. The inclusion of harmful ultraviolet or ionizing radiation in the phototherapy is neither essential nor preferred.

0824 Vaccine against Hepatitis A Virus
R. H. Purcell, J. R. Ticehurst, J. I. Cohen, S. U. Emerson, S. M. Feinstone
Department of Health and Human Services, Washington, DC
Filed 12 Jul 88, patented 16 Jan 90 18p
PATENT-4 894 228 Available from Comm. of Patents
The present invention provides a complete nucleotide sequence of attenuated hepatitis A virus, HAV strain HM-175 Pass 35, which is significantly different from wild-type HAV. The new strain of HAV differs from wild-type HAV HM-175 by several nucleotide changes distributed throughout the genome, is attenuated for chimppanzees, elicits serum neutralizing antibodies, and is suitable for use as an HAV vaccine. It is noted, however, that not all the changes in HM-175 Pass 35 are necessary for attenuation and use as a vaccine. The attenuated virus of the present invention grows well in cell culture. The invention describes those mutations that are involved in cell culture adaptation and attenuation.

0825 Vaccine Against Rotavirus Diseases and Method of Preparing Same
R. M. Chanock, A. Kapikian, K. Midthun, J. Flores, M. Gorziglia
Department of Health and Human Services, Washington, DC
Filed 21 Sep 87, patented 22 May 90 2p
PATENT-4 927 628 Available from Comm. of Patents
A new method for producing live, attenuated rotavirus strains suitable for preparing a vaccine is described. It is demonstrated that a naturally attenuated rotavirus recovered from newborns or other individuals who have undergone asymptomatic infection can be used for immunization or that a virulent rotavirus can be converted into an attenuated strain by substituting the conserved fourth rotavirus gene segments of a naturally attenuated rotavirus in the genome of the virulent rotavirus.

0826 Vector with Multiple Target Response Elements Affecting Gene Expression
J. Lisziewicz
National Cancer Inst., Bethesda, MD
Filed 18 Jan 90 23p
PAT-APPL-7-467 407 Available from NTIS: price code N03
The purposes of the invention are: to provide a means of inhibiting gene activity by providing an excess of target activation response nucleotide sequences; to provide constructs which down-regulate a gene expression by including in the construct multiple target activation response sequences; to provide a method of inhibiting tat function by providing constructs having multiple sequences of TAR RNA in tandem which will function to down-regulate transactivation of HIV-LTR to inhibit expression of tat; to provide a means of gene therapy that will decrease destructive effects of HIV viral activity; and to provide, through use of constructs containing multiple TAR RNA sequences a means of producing an inhibitory effect on the HIV-LTR activity.

MINING

0827 Concave Drag Bit Cutter Device and Method
R. Morrell, D. Larson
Department of the Interior, Washington, DC
Filed 16 Jul 90 13p
PAT-APPL-7-553 467 Available from NTIS: price code N03
A method of cutting using a drag bit is provided wherein drag bit having a concave cutting insert or face is employed and a cut is made the depth of which is at least approximately one-fourth of the diameter of the cutter insert or face. It has surprisingly been found that the use of such a concave cutting bit under the conditions set forth, i.e., wherein a relatively deep cut is provided, results in substantially improved efficiency as compared with conventional drag bits. The improved cutting efficiency is the product of a reduction on both the cutting forces and the thrust forces that must be exerted. It will be appreciated that this is an important advantage in that less horsepower is thus required to cut or mine a given volume of material and such reduced horsepower means lower capital and operating costs.

0828 Explosion Suppression System
M. Sapko, R. Cortese
Department of the Interior, Washington, DC
Filed 19 Jul 90 16p
PAT-APPL-7-555 211 Available from NTIS: price code N03
In accordance with the present invention, an explosion suppression system and triggering apparatus are provided for quenching gas and dust explosions where such explosions are characterized by a flame propagating along a path. The suppression system includes an electrically actuated suppression means for dispensing an extinguishing agent into the path ahead of the propagating flame. A triggering device for the suppression means then includes a light powered triggering means located upstream along the path of the propagating flame from the suppression means. This light powered triggering means receives light from the propagating flame and converts this light to an electrical actuation signal for the suppression means.

0829 Method and Composition for Controlling Dust Emissions
H. Kalau
Department of the Interior, Washington, DC
Filed 14 Feb 90 19p
PAT-APPL-7-480 197 Available from NTIS: price code N03
The invention relates in general to a method and composition for controlling the emission of dust in a variety of settings, and in particular, to a composition comprising a polyethylene oxide polymer and an anionic surfactant which can be used to enhance the coal-wetting action in a water spray and reduce the emission of coal dust in an underground mining operation.

0830 Method for Particle Stabilization by Use of Cationic Polymers
K. E. Hjelmstad
Department of the Interior, Washington, DC
Filed 27 Dec 88, patented 15 May 90 1p
PATENT-4 925 247 Available from Comm. of Patents
A method of increasing recovery of mineral and metals during in-situ chemical leaching of earth material by injection of a treating fluid which comprises cationic, organic

polymers which are made up of long chain hydrocarbon molecules of very great molecular weight (in excess of 1000 and as great as 1,000,000). Maintaining clays in a flocculated state and preventing the formation of colloidal particles improves permeability during chemical leaching of clay bearing earth materials.

0831 Method of Enhancing Rock Fragmentation and Extending Drill Bit Life
W. Engelmann
Bureau of Mines, Washington, DC
Filed 18 Jul 90 37p
PAT-APPL-7-553 510 Available from NTIS: price code N03
The invention pertains to drilling and rock excavation including drilling for exploration, mining, mineral development, and sampling and monitoring wells such as gas, oil and water wells. The invention will be applicable to the mining industry, the dimension stone industry, the construction industry, the oil and gas industry, and any other industries that are involved in the drilling, cutting, and grinding of rock, coal, or concrete, or in tunneling through rock. Furthermore, the invention should be applicable to the cutting, drilling, and grinding of other materials including metals, ceramics, other refractory materials, and also biological caries as in dental drilling of teeth.

0832 Method of Locating Underground Mine Fires
W. Pomroy, L. Laage
Department of the Interior, Washington, DC
Filed 3 Jul 89 11p
PAT-APPL-7-375 549 Available from NTIS: price code A03
An improved method of locating an underground mine fire by comparing the pattern of measured combustion product arrival times at detector locations with a real time computer-generated array of simulated patterns has been developed. A number of electronic fire detection devices are linked thru telemetry to a control station on the surface. The mine's ventilation is modeled on a digital computer using network analysis software. The time required to locate a fire consists of the time required to model the mine's ventilation, generate the arrival time array, scan the array, and to match measured arrival time patterns to the simulated patterns.

0833 Method of Mapping Underground Mines
D. Scott
Department of the Interior, Washington, DC
Filed 5 Jul 90 7p
PAT-APPL-7-548 337 Available from NTIS: price code N03
The invention provides a method wherein a light emitting device, such as a laser, is used to precisely measure strike measurements of planar geologic features; for example, bedding planes, fractures, or fold axes. A pre-existing survey line between two spads is first located on a plan view map of the mine. A tape measure is placed between the two located spads in the mine. A laser is then placed on the planar surface to be measured, and the instrument leveled. The laser unit in the instrument is activated and the beam located at its intersection with the tape measure. The location point of the laser unit on the wall of the mine is marked on a mine map, the point on the tape where the beam intersects the tape is marked on a mine map, and a line is drawn between the two points. This line defines the strike of the planar feature relative to the survey line.

0834 Method of Mining A Mineral Deposit Seam
R. Farrar, W. Mayercheck, G. Bockosh
Department of the Interior, Washington, DC
Filed 9 Nov 89 20p
PAT-APPL-7-434 062 Available from NTIS: price code N03
The invention relates in general to a method of mining a seam of a mineral deposit such as coal, and more particularly to a method of mining coal using a continuous loop chain or cable drawn cutting device directed through the seam to remove the coal while causing minimal disruption to the overburden above the mineral deposit seam.

0835 Microwave Assisted Hard Rock Cutting
D. Lindrom
Department of the Interior, Washington, DC
Filed 9 Apr 90 14p
PAT-APPL-7-506 054 Available from NTIS: price code N03
The present invention relates to the use of microwave radiation to facilitate the mining of hard rocks by the sequential and simultaneous exposure of a rock strata to microwave radiation followed by a mechanical cutting tool. The present invention is a combined electromagnetic and mechanical energy form process for cutting rocks that includes the stages of microwave radiation to thermally preweaken the rock before it is attacked by the mechanical cutter machinery itself. In the continuous cutting process, the rock is first thermally preweakened by applying the microwave energy immediately ahead of the cutter and secondly, is physically cut by encountering the mechanical cutting bit/tool. The noncontact radiation transfer of energy by microwaves does not interrupt the mechanical cutting, but does manifest a change in the rock; weakening it by any number of a variety of phenomena.

Optical Beamformers
See 0359

0836 Process for Acid Leaching of Manganese Oxide Ores Aided by Hydrogen Peroxide
J. P. Allen, R. R. Corwin
Department of the Interior, Washington, DC
Filed 8 Aug 88, patented 10 Oct 89 5p
PATENT-4 872 909 Available from Comm. of Patents
A method of processing manganese ore by adding the ore to an aqueous solution of acid and H_2O_2 to form a leach pulp. The leach pulp is agitated for a predetermined time period at predetermined temperatures. The leach pulp is then separated into a solid fraction and a liquid fraction containing solubilized metals. The solubilized metals are then recovered from the liquid fraction.

0837 Suspension Arrangement for Flexible, Retractable Air Conduit
A. G. Mayton, W. D. Mayercheck, J. C. Volkwein, A. J. Kwitowski
Department of the Interior, Washington, DC
Filed 5 Jun 90 11p
PAT-APPL-7-533 647 Available from NTIS: price code N03
In accordance with the invention, an effective interface is provided between independently movable mining machines such as a mobile CMM and a mobile CFHS. More particularly, interfacing of a flexible ventilation system is provided between the two machines so as to produce a more productive, cleaner and safer environment at the working face in an underground mine. The invention provides for support (suspension) and transport of the ventilation system along

the side of, or at another location on, the individual underground mining machines so as to enable proper ventilation to be maintained.

0838 Ultrasonic Flotation System
C. Jordan
Department of the Interior, Washington, DC
Filed 21 Jun 90 18p
PAT-APPL-7-541 689 Available from NTIS: price code N03
It is an object of the present invention to advance the technology of flotation beneficiation by providing a continuous ultrasonic flotation unit designed to focus the micro-agitation of ultrasonic vibrations on the ore pulp in a small mixing chamber for short period of time. It is another object of the present invention to provide a continuous ultrasonic flotation unit which permits a mixture of ore, water and air to be ultrasonically agitated as it is passed through a small mixing chamber. A further object yet still of the present invention is to provide a ultrasonic flotation system which permits the mixture to exit from the agitation chamber so that the air bubbles, with the hydrophobic particles already attached, quickly rise to the top of the separator.

NAVIGATION & GUIDANCE

0839 Apparatus for and a Method of Determining Compass Headings
D. G. Jablonski
Department of the Navy, Washington, DC
Filed 24 Jun 85, patented 14 Nov 89 5p
PATENT-4 881 080 Available from Comm. of Patents
A compass system and method incorporating a global positioning system (GPS), such as the NAV-STAR/GPS multi-satellite system, is configured to acquire accurate compass heading information without being affected by magnetic anomalies and without being dependent on the elapsed time since a previous position fix. The compass system comprises, inter alia, two antenna/preamplifiers located, for example, fore and aft a ship or aircraft separated by a predetermined distance d. A microprocessor/minicomputer portion of the system causes an electronic coaxial switch to switch a GPS receiver between the two antenna/preamplifiers automatically thereby measuring their absolute positions. The microprocessor/minicomputer computers and displays on a display unit a compass heading based on the knowledge of the absolute positions of the antenna/-preamplifiers and the distance d there between. Patents.

Efficient Detection and Signal Parameter Estimation with Application to High Dynamic Gps Receiver
See 0938

0840 Gyro Sensor Block Suspension
A. D. Cangialosi
Department of the Navy, Washington, DC
Filed 7 Nov 83, patented 13 Aug 85 5p
PATENT-4 534 648 Available from Comm. of Patents
A suspension mount is provided for a gyro sensor block suspension which eliminates dither cross-talk in a gyro triad having a set of common gyros with the same dither tuned suspension. A sensor block has three gyro mount locations situated such that, when attached, the gyro triad is mutually orthonogal to each other. Two of the gyro mount locations have a spring suspension, each of a different stiffness, formed by joining a central hub, to which the gyro is attached, with the sensor block mass via plurality of spikes to form a torsional spring about the gyro dither axis. Patents.

Programmable Near-Infrared Ranging System
See 0506

Radar Guidance System
See 0370

0841 Radiosonde
D. A. Rosenthal
Department of the Navy, Washington, DC
Filed 7 Apr 81, patented 24 Apr 84 6p
PATENT-4 445 120 Available from Comm. of Patents
An apparatus and method for measuring elevation of vehicles, such as aircraft or re-entry vehicles, are provided by identifying the specific geographic location of the vehicle in question and its difference from the geographic location of a reference station. The reference station altitude is then used as an arbitrary level to measure differences in elevation of the vehicle in question. The present method involves vehicles equipped with onboard global navigational equipment. Currently world wide networks such as Omega and Loran permit ships to determine their geographic location at any given time. For purposes of the present invention, the phrase 'geographic location' refers to the latitude and longitude of the object to be located and does not include the elevation of the object. The object of undetermined elevation can be a radiosonde used to gather information prior to reentry of missile from above the atmosphere or it could be equipment on a re-entry vehicle itself. It is also possible with present electronics to design systems using the present invention to locate aircraft altitude with respect to known reference stations. Patents.

Semi-Automatic Direction Finding Set
See 0941

PHOTOGRAPHY & RECORDING DEVICES

Immediate Write, Read, and Erase Optical Storage Medium and Method of Marking and Erasing
See 0165

Method to Image High Speed Events Using a Standard Video Camera
See 0348

Process of Three Dimensional Lithography in Amorphous Polymers
See 0094

Soft x-ray reduction camera for submicron lithography
See 0297

Vegetable Oil-Based Printing Ink
See 0152

PHYSICS: Image Processing & Pattern Recognition

All-Optical Device and Method for Remapping Images
See 0846

Automatic Classification of Images
See 0192

0842 Image Preprocessing by Modified Median Filter
B. O. May
Department of the Navy, Washington, DC
Filed 5 Apr 88, patented 24 May 85 6p
PATENT-4 736 439 Available from Comm. of Patents
Preprocessing of a noisy image, such as is obtained by a raster scan, by subtracting the median of the pixel values of one or more lines from the medians of predetermined pixel neighborhoods. Patents.

0843 Method of Enhancing the Signal to Noise Ratio of an Image Recognition Correlator
J. L. Horner
Department of the Air Force, Washington, DC
Filed 24 Sep 87, patented 2 May 89 9p
PATENT-4 826 285 Available from Comm. of Patents
Method of producing an enhanced output correlation signal from an image matching correlator includes the steps of further transforming data representing an input image to produce a transformed image, multiplying the transformed image by at least one reference filter function representing a reference image to be compared with the input image to produce a product signal, inverse fourier transforming the product signal to produce the output correlation signal, and introducing phase distortions within the reference filter function, sufficient to greatly enhance peak values and narrow the area of the correlation peak of the output correlation signal. The method may utilize optical or digital electronic correlation and transformation. Patents.

Network of Dedicated Processors for Finding Lowest-Cost MAP Path
See 0170

0844 Video Line Processor
D. E. Hinman, V. A. Anderson, J. H. Bumgardner
Department of the Navy, Washington, DC
Filed 4 Apr 89, patented 18 Jun 86 16p
PATENT-4 819 190 Available from Comm. of Patents
A video line processor for varying the size of a video image portion along a video line in an image processor in which image size variation occurs first along horizontal lines and then along vertical lines and in which intermediate and final frames are stored in memories in which row and column addressing is interchanged on alternate frames. The line processor has a line memory for storing pixel values along each video line, has a pair of arithmetic circuits, one of which receives pixel values delayed in relation to pixel values received by the other, and has a coefficient memory with memory locations corresponding to pixel values along a video line, each of these locations being loaded between video frames with an address for the line memory and with coefficients for the arithmetic circuits to control, respectively, the position of each pixel value along a line and the transformation of the value. Patents.

0845 Video Zoom Processor
D. E. Hinman
Department of the Navy, Washington, DC
Filed 19 Mar 84, patented 30 Dec 86 15p
PATENT-4 633 503 Available from Comm. of Patents
A video zoom processor digitally processes video imagery information in a simultaneous two-dimensional format. Size and position transformation factors are incorporated in the image via processing. The size specification delay for the reduction factor is one video frame time and for the expansion factor it is zero video frame time. The specification delay for the position or translation factor is zero video frame time. Also implemented into the processed image is the pixel averaging algorithm in which each output pixel is the value of the weighted average of certain input pixels for purposes of gray level determination. Keywords: Patents, PAT-CL-382-47.

PHYSICS: Optics & Lasers

Adaptive Associative-Processing Optical Computing Architectures
See 0154

Adjustable Twister
See C249

0846 All-Optical Device and Method for Remapping Images
J. L. Johnson
Department of the Army, Washington, DC
Filed 20 Feb 90 13p
PAT-APPL-7-481 922 Available from NTIS: price code N03
An all-optical polar transform device transforms an image in rectangular coordinates into an image in polar coordinates by reflecting an input image-containing beam from a series of suitably positioned reflective surfaces and finally transmits the beam out as an output beam containing the transformed image. Patent applications.

0847 Analog Frequency Modulated Laser Using Magnetostriction
L. T. Kabacoff
Department of the Navy, Washington, DC
Filed 13 Nov 89, patented 26 Jun 90 7p
PATENT-4 937 833 Available from Comm. of Patents
The present invention relates to an analog frequency modulatable laser. The radiation of the lasing medium is analog frequency modulated by change of the optical path length by movement of reflective mirrors forming the resonant cavity at the frequency of radiation of the laser in a manner corresponding to an information signal. In one embodiment, a magnetostrictive material is deposited on and bonded to the outer periphery of an active lasing medium having appropriate mirrors on the end thereof. The magnetostrictive material is exposed to an information encoded magnetic field and physically expands or contracts the physical length of the lasing medium along the optical axis of the lasing medium corresponding to the modulated information of the magnetic field. In another embodiment an optical fiber is secured by cementing or clamping to a transparent end of the active lasing material and one of the optical cavity reflecting mirrors is disposed on the outside end of the optical fiber with the magnetostrictive material being disposed on the optical fiber. Patents.

Apparatus and Method for Minimizing Polarization-Induced Signal Fading in an Interferometric Fiber-Optic Sensor Using Input-Polarization Modulation
See 0307

0848 Apparatus and Method for Optimizing the Modulation Efficiency of a Remotely-Located, Polarization-Sensitive, Integrated Optic Modulator Which is Addressed with a Non-Polarization-Preserving Fiber
C. H. Lumber, W. K. Burns, A. D. Kersey
Department of the Navy, Washington, DC
Filed 31 Jan 90 22p
PAT-APPL-7-472 934 Available from NTIS: price code N03
The present invention relates to integrated optic modulators and particularly to an apparatus and method for controlling the polarization state of light propagation through a non-polarization-preserving fiber to a remotely-located integrated optic modulator so that the polarization state of light arriving at the input of the integrated optic modulator is maintained in the particular state required for optimum operation of the integrated optic modulator. Keywords: Patent applications; Military publications; Periodicals.

0849 Apparatus for the Efficient Wavelength Conversion of Laser Radiation
M. K. Chun, L. Goldberg, J. F. Weller
Department of the Navy, Washington, DC
Filed 26 Jun 89 19p
PAT-APPL-7-370 965 Available from NTIS: price code N03
An apparatus for generating coherent radiation at a desired frequency is disclosed. In a preferred embodiment the apparatus comprises: an injection-locked semiconductor diode structure having a large active area for emitting a diffraction-limited beam at a preselected frequency; optics for focusing the diffraction-limited beam into a focused beam; a nonlinear crystal responsive to the focused beam for producing a beam of laser power which includes an output beam at a desired harmonic of the preselected frequency; and a device for passing the output beam in a given direction. In a modification of the preferred embodiment, the output of the injection-locked semiconductor diode structure is mixed with an emission from a laser source in the nonlinear crystal to produce a desired sum or difference frequency. Keywords: Potassium nitrate; Injection locked diode lasers; Semiconductor laser; Gallium aluminum arsenides; Frequency doubling; Second harmonic generation; Patent application.

0850 Apparatus for the Efficient Wavelength Conversion of Laser Radiation
M. K. Chun, L. Goldberg, J. F. Weller
Department of the Navy, Washington, DC
Filed 26 Jun 89, patented 6 Mar 90 16p
PATENT-4 907 238 Available from Comm. of Patents
An apparatus for generating coherent radiation at a desired frequency is disclosed. In a preferred embodiment the apparatus comprises: an injection-locked semiconductor diode structure having a large active area for emitting a diffraction-limited beam at a preselected frequency; optics for focusing the diffraction-limited beam into a focused beam; a nonlinear crystal responsive to the focused beam for producing a beam of laser power which includes an output beam at a desired harmonic of the preselected frequency; and a device for passing the output beam in a given direction. In a modification of the preferred embodiment, the output of the injection-locked semiconductor diode structure is mixed with an emission from a laser source in the nonlinear crystal to produce a desired sum or difference frequency. Patents.

Calibrated Bender for Fiber Optic Cable Position Determination
See 0312

Catalyst for Carbon Monoxide Oxidation
See 0105

Cerenkov Electrooptic Shutter
See 0313

0851 CO2 Laser Plus Optimization for Harmonic Generation
B. J. Feldman
Department of the Navy, Washington, DC
Filed 10 Mar 87, patented 5 Sep 89 5p
PATENT-4 864 580 Available from Comm. of Patents
This patents discloses a pulsed carbon dioxide laser that eliminates the nitrogen tail on the pulse by placing a Brewster angle absorption cell inside the optical cavity of the laser. This Brewster angle absorption cell contains a gas which exhibits a preferential absorption in the 10 micrometer spectral regime. This preferential absorption causes the laser to lase in the 9.6 micrometer regime which allows for easier harmonic generation and elimination of the nitrogen tail.

0852 Defense to Laser Light Irradiation
J. D. Barry, C. J. Kennedy
Department of the Air Force, Washington, DC
Filed 6 Jan 82, patented 1 Aug 89 7p
PATENT-4 852 452 Available from Comm. of Patents
A satellite defends itself by having a plurality of corner cube retroreflectors with shutters, each having a laser light sensor. It is assumed that the attacker first must obtain positional and range information with a pulsed laser. When one of the sensors detects these low power laser pulses, it causes the shutter of the corner cube array to open and return the pulses with sufficient strength to saturate or damage the attack sensors. Patents.

Device for Regulating Luminous Flux of Battery Powered Headlamp
See 0624

0853 Differential Polarimetric Fiber Optic Sensor
A. D. Kersey
Department of the Navy, Washington, DC
Filed 16 Jan 90 17p
PAT-APPL-7-465 677 Available from NTIS: price code N03
This patent application discloses a differential polarimetric fiber optic sensor is disclosed in which a local compensating fiber section is spatially separated from a remote sensing fiber section by input and output polarization-maintaining fibers in order to permit the remote passive interrogation of the remote sensing fiber section by the direct polarization analysis of the light at the output of the local compensating fiber section. Keywords: Patent applications; Polarimetry; Fiber optics; Sensors; Remote sensing fibers; Light transmission; Optical properties; Serial No. 465,677; Filing date: 16 January 1990.

0854 Diffraction Limited Dichroic Combiner Diode Laser
W. L. Casey
Department of the Air Force, Washington, DC
Filed 10 Nov 86, patented 18 Apr 89 10p
PATENT-4 823 357 Available from Comm. of Patents
A laser transmitter is disclosed in which the laser combines the outputs of numerous laser diodes using dichroic combi-

nation to produce a high power, diffraction limited beam which may be transmitted at minimum beam divergence using the full aperture of the transmitter telescope. The individual diode beams are combined and superimposed in the laser, and are transmitted superimposed in the near and far field of the transmitter telescope. The dichroic combining process is as follows. A collimate beam of a first wavelength is directed at a narrowband or long wave pass filter which is tilted slightly (about 10 degrees). This beam passes through the filter. A beam of a second wavelength is directed toward the exist side of the filter (which acts as a mirror) at such an angle that the second beam is reflected colinear with the first beam and superimposed on it. This process of superimposing the laser beams continues as each laser beam from the laser diodes is added to form a combined laser beam. Patents.

Electron Beam Apparatus for Testing Infrared Detectors in a Cryogenically Shielded Environment
See 0321

0855 Extreme ultraviolet reflector
B. E. Newman
Los Alamos National Lab., NM.; Department of Energy, Washington, DC
Filed 6 Feb 89 21p
PAT-APPL-7-306 358 Available from NTIS: price code A03
A multi-faceted mirror forms a retroreflector for a resonator loop in a free electron laser (FEL) operating in the XUV ((lambda)--10--100 nm). The number of facets is determined by the angle-of-incidence needed to obtain total external reflectance (TER) from the facet surface and the angle through which the FEL beam is to be turned. Angles-of-incidence greater than the angle for TER may be used to increase the area of the beam incident on the surface films having TER in the 10--100 nm range may be formed from a variety of materials, including Al, single-crystal Si, Ag, and Rh. One of the facets is formed as an off-axis conic section to collimate the output beam with minimum astigmatism.

0856 Feedback stabilization system for pulsed single-frequency tunable lasers
P. Esherick, T. D. Raymond
Sandia National Labs., Albuquerque, NM.; Department of Energy, Washington, DC
Filed 20 Apr 89 12p
PAT-APPL-7-340 823 Available from NTIS: price code A03
A feedback stabilization system for pulse single-frequency tunable lasers having an excited laser medium contained within an adjustable length cavity and producing a laser beam through the use of an optical element, including detection of angular deviation in the output laser beam, and generating an error signal based thereon. The error signal can be integrated and amplified and then applied as a correcting signal to a piezoelectric transducer mounted on a mirror of the laser cavity for controlling the cavity length.

Ferroelectric Optical Switching
See 0323

0857 Fiber Bundle Homogenizer and Method Utilizing Same
S. D. Russell, G. P. Imthurn
Department of the Navy, Washington, DC
Filed 7 Sep 89, patented 12 Jun 90 1p
PATENT-4 932 747 Available from Comm. of Patents
An apparatus and method are provided to homogenize the intensity profile of the beam emitted by an excimer laser. The excimer laser beam is collected by a closely packed ultraviolet-grade optical fiber bundle array having its individual fibers intermingled in a random or preconceived format to result in an intermixing of the light from the individual fiber cores to produce a uniform intensity profile. The output ends of the fibers are gathered or fused, and optionally tapered before being cleaved to provide an output face that is custom shaped for a desired illumination pattern. The flexible nature of the fiber bundle allows for remote materials processing applications. Patents.

0858 Fiber Optic Cable Splice
A. B. Estabrook, L. A. Shook, G. N. Daguio, R. M. Baker
Department of the Navy, Washington, DC
Filed 30 Mar 88, patented 11 Jul 89 8p
PATENT-4 846 545 Available from Comm. of Patents
An apparatus that joins ends of fiber optic cables includes a fiber protection sleeve fitted over an area of optical coupling to cover bare optical fibers at the coupling. The sleeve extends from the bare fibers to cover a portion of a buffer section of each cable. The fiber protection sleeve has an inner heat shrinkable tube that overlaps the area of optical coupling, a flexure suppressant rigidity member disposed exteriorly adjacent the inner heat shrinkable tube, and an outer heat shrinkable tube that overlaps the rigidity member and the inner heat shrinkable tube. The inner and outer heat shrinkable tubes are shrink-fitted to strengthen and seal the area of optical coupling. Additionally, a strength member sleeve is fitted over cable strength member sections that are interlayed over the fiber protection sleeve. Patents.

0859 Fiber Optic Sensing System
G. Adamovsky
National Aeronautics and Space Administration, Cleveland, OH. Lewis Research Center
Filed 7 Sep 89 14p
PAT-APPL-7-404 291 Available from NTIS: price code N03
A fiber optic interferometer utilizes a low coherence light emitting diode (LED) laser as a light source which is filtered and driven at two RF frequencies, high and low, that are specific to the initial length of the resonator chamber. A displacement of a reflecting mirror changes the length traveled by the nonreferencing signal. The low frequency light undergoes destructive interference which reduces the average intensity of the wave while the high frequency light undergoes constructive interference which increases the average intensity of the wave. The ratio of these two intensity measurements is proportional to the displacement incurred.

Field Induced Gap Infrared Detector
See 0326

0860 High Optical Density Measuring Spectrometer
J. A. Welch
Department of the Navy, Washington, DC
Filed 29 Sep 89 13p
PAT-APPL-7-415 740 Available from NTIS: price code N03
An apparatus is disclosed for measuring the spectra of a high optical density sample having substantially known optical properties. In a preferred embodiment, the apparatus comprises: a laser for producing a light beam; a Raman cell responsive to the light beam for generating a first light containing a plurality of preselected wavelength components; an optical system for directing the first light through the sample; a dispersion device for spatially separating the first

light passed through the sample into its plurality of preselected wavelength components. Patent applications.

0861 High Power Optical Attenuator
C. D. Marrs, W. N. Faith
Department of the Navy, Washington, DC
Filed 1 Jun 87, patented 31 May 88 6p
PATENT-4 747 673 Available from Comm. of Patents
An attenuator for high power laser beams is described. The attenuator has an annular beam dump through which the beam passes diametrically and in which the beam passes successively through a pair of pivoting transmissive and reflective elements. These elements are individually mounted on intermeshed gears so that the elements are adjustable through equal and opposite angles. At each element a portion of the beam is reflected toward the dump and a portion transmitted, the relative energy in each portion being determined by the angle of the elements to the beam so that adjustment of this angle determines the amount of attenuations. The beam is offset oppositely by refraction at each element so that attenuator does not change the beam path. The elements are, preferably, elements commonly used as edge filters, that is, interference filters having an abrupt monotonic transition with wavelength from reflection to transmission. Patents.

High Power, Solid State RF Pulse Generators
See 0222

0862 High Resolution Cinephotographics System Pressure Vessel
R. J. Becker, J. M. Aulds
Department of the Air Force, Washington, DC
Filed 20 Nov 87, patented 30 May 89 15p
PATENT-4 834 945 Available from Comm. of Patents
A propellant sample combustion apparatus employing a multiply optical ported pressure vessel for sample illumination, sample viewing, and sample burn face elevation is described. High-speed motion picture filming using short-duration high-intensity laser provided optical illumination from a copper-vapor laser is employed. Details of the employed pressure vessel, a burn inhibiting coating for the propellant sample, a laser coherence spoiler, and a sample level maintaining closed-loop apparatus are also disclosed. Patents.

0863 Improved Compact Optical RF Spectrum Analyzer
J. N. Lee, C. M. Verber
Department of the Navy, Washington, DC
Filed 10 Jan 90 24p
PAT-APPL-7-463 063 Available from NTIS: price code N03
This invention relates to a laser-driven RF spectrum analyzer having surface diffraction means for diffracting a laser beam and a surface acoustic wave intercepting the diffracted beam so as to enable analysis of a detected RF signal and, more particularly, it concerns an improved laser-driven and compact and optical RF spectrum analyzer having enhanced surface diffraction means for selectively diffracting, expanding and focusing (converging) a laser beam prior to the diffracted beam intercepting a novel surface acoustic wave arrangement where the wave thereof is indicative of a detected RF signal and further diffracts the intercepted beam so that it is further deflected for detection by detector array means of the RF spectrum analyzer thereby enabling analysis of the frequency distribution and intensity of the detected signal. Keywords: Patent applications.

0864 Large Angle Off-Axis Beam Steering of a Phased Telescope Array
P. J. Wallentine, M. G. Baciak, R. A. Carreras, E. L. Coates, D. G. Haralson
Department of the Air Force, Washington, DC
Filed 14 Apr 88, patented 16 May 89 6p
PATENT-4 831 246 Available from Comm. of Patents
A system and method for large angle off-axis steering of the composite beam from a phased array telescope system. Patents.

0865 Laser Beam Stop
R. B. Thompson
Department of the Navy, Washington, DC
Filed 13 May 90 11p
PAT-APPL-7-531 422 Available from NTIS: price code N03
A laser beam stop is constructed having a uniquely designed cell filled with a solution or suspensions of an absorbing species chosen to absorb the wavelength of light emitted by the laser. The position and strength of the laser beam are indicated by the strength and depth of penetration of the fluorescence excited by the laser. Patent application.

Laser Communication System With Wide Band Magnetostrictive Modulation
See 0148

Laser Diode Pumped, Erbium-Doped, Solid State Laser With High Slope Efficiency
See 0632

Long wavelength, high gain InAsSb strained-layer superlattice photoconductive detectors
See 0336

Long Wavelength Infrared Detector with Heterojunction
See 0338

0866 Method and Apparatus for Determining Optical Absorption and Emission Characteristics of a Crystal or Non-Crystalline Fiber
C. E. Byvik, A. M. Buonchristiani
National Aeronautics and Space Administration, Hampton, VA. Langley Research Center
Filed 16 Aug 88, patented 2 Jan 90 8p
PATENT-4 890 915 Available from Comm. of Patents
This invention relates generally to spectroscopy and, more particularly, to a method and apparatus for performing spectroscopic analysis of crystal and noncrystalline fibers. The invention provides a complete absorption curve for a material using a crystal fiber which can be more easily produced than the types of samples required for other methods of obtaining substantially the same absorption curve for identical materials.

0867 Method and Apparatus for Generating Small Angles
R. J. Magee, J. P. Marchi, D. F. Sullivan, G. L. Brown
Department of the Navy, Washington, DC
Filed 5 Jul 88, patented 20 Mar 90 4p
PATENT-4 909 625 Available from Comm. of Patents
A method and apparatus for generating small angles for calibrating autocollimators or the like is described. It includes a small angle wedge which is rigidly attached to a mechanical beam which is rotatable about a pivot point. The rotation of wedge causes a very small deviation in the line of sight of an autocollimator under test after passing

through the wedge and thus gives a large optical advantage. Patents.

0868 Method and Apparatus for Producing a Photopumped VUV Laser in MO6+ Ion-Containing Plasma
U. Feldman, J. Reader
Department of Commerce, Washington, DC
Filed 15 Nov 89, patented 3 Jul 90 2p
PATENT-4 939 744 Available from Comm. of Patents
The invention relates to a method and an apparatus for producing a photopumped VUV laser in an Mo(6+) ion-containing plasma comprise photopumping the Mo(6+) ion-containing plasma with radiation from Mo(11+) ions. In one embodiment, the Mo(6+) ion-containing plasma has an electron density of less than about 10 to the 18 power/cc and the Mo(11+) ions are contained in a plasma having an electron density greater than about 10 to the 20 power/cc.

0869 Method and Circuit for Controlling the Evolution Time Interval of a Laser Output Pulse
N. P. Barnes
National Aeronautics and Space Administration, Hampton, VA. Langley Research Center
Filed 31 May 89 13p
PAT-APPL-7-359 460 Available from NTIS: price code A03
The invention is a method and circuit for controlling the evolution time interval of a laser output pulse used for making precise spectral measurements. It comprises the means for pumping a laser medium in a resonator that includes a Q-switch and polarizer that act in combination to control the loss in the resonator. A photodiode senses the resulting fluorescence which is applied to a two level Q-switch and polarizer from high to intermediate to substantially zero loss states to control the evolution time interval of the resulting laser output pulse.

0870 Method and Circuit for Shaping Laser Output Pulses
N. P. Barnes
National Aeronautics and Space Administration, Hampton, VA. Langley Research Center
Filed 31 May 89 9p
PAT-APPL-7-359 459 Available from NTIS: price code A02
The invention is a method and circuit for shaping laser output pulses from a laser resonator. A Q-switch and polarizer act in combination to control the loss to the resonator and provide the laser output representative of such loss. An optical diode senses the level of the output pulse and provides an output signal that when amplified is used to control voltage from a supply to provide a control signal which is applied to the Q-switch to control the shape of the output pulse by adjusting its length.

0871 Method for Detecting Pinholes and Incomplete Coverage of Hermetic Coatings on Optical Fiber Waveguides
S. DiVita, H. E. Rast
Department of the Navy, Washington, DC
Filed 23 Mar 87, patented 29 May 90 11p
PATENT-4 929 837 Available from Comm. of Patents
A method detects incomplete coverage of hermetic coatings applied to optical fibers during in-line optical fiber fabrication procedures as well as off-line applications. A fluorescent material surrounds the core region of the optical fiber prior to the formation of the hermetic coating on the optical fiber and energy is radiated in the optical fiber to propagate in the cladding mode. This causes an excitation of the fluorescent material to fluoresce in response to the propagated energy. An appropriately disposed detector detects levels of emitted fluorescence along the length of the optical fiber to indicate where the hermetic coating is incomplete or where pinholes in the hermetic coating are located. Optionally, the fluorescent material is located outside of the cladding layer, inside of the cladding layer near its outer surface or throughout the cladding region to fluoresce when excited by the propagated energy. Different wavelengths of radiation can be used which excite different fluorescent materials so that pinholes or incomplete coating coverage can be detected in hermetic coatings that have different chemical compositions. Keywords: Fiber optic, Hermetic seals; Fluorescent material; Chemical composition, Patents.

0872 Method for Holographic Correction of Beams of Coherent Light
C. Gilbreath-Frandsen, J. W. Wagner
Department of the Navy, Washington, DC
Filed 5 Dec 86, patented 7 Nov 89 8p
PATENT-4 878 718 Available from Comm. of Patents
A method for producing desired changes in a beam of coherent light radiating at lambda 1, comprises the steps of (a) splitting a beam of coherent light radiating at lambda 1, correcting one of the beams to achieve a desired wavefront and recombining this beam with the first, where a record medium (I) is placed such that the beams are separated by an angle determined by Bragg's law and the line spacing of the interference pattern formed by the two beams; (b) developing the first medium such that a diffraction grating of spacing d1 is recorded in a material, specifically sensitive to lambda 1, which will become the master; (c) illuminating the master with a second wavelength lambda 2, selected by choice of a second medium which possesses very high diffraction efficiency. The second beam is split into two parts. The first is directed to the master. This diffracted order is recombined with the second beam. These beams are separated by an angle determined by Bragg's law and the line spacing of the interference pattern formed by the two beams. The record of the second medium (II) is placed at this jucture. A second grating with grating spacing d2 is recorded in this medium containing a record of the first hologram diffracted from the master, which forms the working hologram; and (d) illuminating the working hologram with the original beam at lambda 1, at an incidence angle specific to the grating spacing d2 and lambda 1, wherein the desired wavefront at lambda 1, is diffracted. Patents.

0873 Method for Replicating an Optical Element
D. Armitage, J. I. Thackara
Department of the Air Force, Washington, DC
Filed 18 Jun 87, patented 2 May 89 4p
PATENT-4 826 553 Available from Comm. of Patents
A method transfers a dielectric mirror prepared on an optical flat replication substrate to a utilization device having a nonflat surface. In order to separate the replication substrate from the mirror after the mirror has been cemented to the device at room temperature and the cement allowed to cure over an extended time period, the composite assembly is inserted into a fixture which provides a buckling force to the center of the replication substrate to cause the replication substrate to be peeled from the mirror. PAT-156-233.

0874 Method of Laser Discrimination Using Stimulated Luminescence
V. K. Mathur, K. Chakrabarti
Department of the Navy, Washington, DC
Filed 25 Jul 89 11p
PAT-APPL-7-385 032 Available from NTIS: price code N03
This patent application discloses a method of determining the nature of an unspecified laser source using the optically and thermally stimulated luminescence characteristics of a single MgS phosphor doped with either Ce, Sm or Eu, Sm ions. The doped MgS phosphor is first exposed to charging radiation thereby allowing electron trapping to occur. Subsequent to the electron trapping, the phosphor is exposed to the energy of an unspecified laser source which frees the trapped electrons. The freed electrons are than available for recombination which results in a specific color luminescence indicative of the type of laser source.

Method of Making Carbon Dioxide and Chlorine Free Fluoride-Based Glass
See 0611

Mode Field Conditioner
See 0351

0875 Monolithic Laser Diode Structure for Microwave Generation
L. Goldberg, J. F. Weller
Department of the Navy, Washington, DC
Filed 4 May 89 20p
PAT-APPL-7-347 132 Available from NTIS: price code A03
A semiconductor laser structure for generating high frequency modulation of light intensity is disclosed. The apparatus comprises a semiconductor substrate, a semiconductor master laser and first and second semiconductor slave lasers fabricated adjacent to each other on the semiconductor substrate. Bias current applied to the master oscillator is modulated at a preselected frequency to cause the master laser to generate a plurality of optical frequency modulation sidebands, The first and second slave lasers, which are tuned to be close to the preselected first and second sidebands of the master laser, are injection-locked to the first and second preselected sidebands of the master laser. Patent applications.

0876 Monolithic Optical Programmable Spectrograph (MOPS)
P. B. Dorain, J. Snow
Department of the Navy, Washington, DC
Filed 21 Nov 89 9p
PAT-APPL-7-417 623 Available from NTIS: price code N03
The Monolithic Optical Programmable Spectrograph (MOPS) is a rugged, vibration resistant, inexpensive, compact spectrograph. It is capable of simultaneous multi-channel measurements of wavelengths and bandwidths of sources in the visible light and near infrared spectrums and has a resolution more than sufficient to resolve the near infrared 1060 nm wavelengths in the first order from the optical wavelengths 454, 472, 488, 496, 514, and 532 nm in the second order. The MOPS has sufficient linear space at the exit focal plane to accommodate a standard linear diode array package. This means that the wavelength dispersion is sufficient so that the wavelengths of interest are spread over about two centimeters. The spectrograph uses a grating with a large number of grooves/mm blazed to scatter light in second order. This enables the spectrograph to be smaller by a factor of two than if the grating were operating in the first order. The MOPS utilizes the favorable geometry for the spectrograph that is afforded by the Czerny-Turner geometric configuration. It is constructed by BK7 optical glass for rigidity. Keywords: Patent applications.

Multichannel Fiber Optics Connector
See 0355

Multicolor Infrared Photodetector
See 0356

Multiple Axis, Fiber Optic Interferometric Seismic Sensor
See 0204

0877 Narrow Band and Wide Angle Hemispherical Interference Optical Filter
H. Rieger
Department of the Navy, Washington, DC
Filed 27 Jun 88, patented 25 Jul 89 8p
PATENT-4 851 664 Available from Comm. of Patents
An optical interference filter has narrow linewidth and wide acceptance angle and includes a hemisphere coated to provide a narrow bandpass filter at a desired wavelength at normal incidence while other wavelengths at normal incidence are absorbed or reflected. A photodetector placed at the center of the hemisphere detects the desired wavelength only. Other wavelengths that are shorter than the wavelength of the filter are transmitted through the filter to be absorbed by a black absorbing surface around the photodetector. Thus, only the frequency of interest at normal incidence provides a representative signal at the detector. Patents.

0878 Narrow-Bandwidth Unstable Laser Resonator
J. F. Reintjes, D. G. Cooper
Department of the Navy, Washington, DC
Filed 21 Oct 88, patented 19 Sep 89 16p
PATENT-4 868 515 Available from Comm. of Patents
This invention discloses narrow-bandwidth, unstable laser resonator comprising: an output section including a laser gain medium for generating and amplifying light, a first reflective element for reflecting and collimating light from the gain medium back through the gain medium, and a second reflective element having a hole therein. The second reflective element is responsive to the collimated light passed through the gain medium for reflecting most of the collimated light out of the unstable laser resonator as an output beam and for passing the remaining portion of the collimated light through the hole therein as a residual beam. A feedback ring includes an optical path, a beam splitter for passing a first portion of the residual beam into the optical path in a first direction, and a frequency-narrowing element disposed at a position in the optical path where the first portion of the residual beam is collimated. The frequency-narrowing element is operative to narrow the frequency bandwidth of the first portion of the residual beam to produce a narrow-bandwidth collimated beam. A lens is disposed in the optical path for focusing the narrow-bandwidth collimated bean to cause light from that beam to be reflected from the beam splitter and passed through the hole in the second reflective element as a narrow-bandwidth convergent beam is amplified by the gain medium. Keywords: Patents.

Neutron-driven gamma-ray laser
See 0915

0879 Nonlinear Optical Protection against Frequency Agile Lasers
V. P. McDowell
Department of the Navy, Washington, DC
Filed 4 Aug 88, patented 20 Mar 90 9p
PATENT-4 909 609 Available from Comm. of Patents
An eye protection or equipment filter device protection from laser energy is disclosed. The device may be in the form of a telescope, binoculars, goggles, or constructed as part of equipment such as image intensifiers or range designators. Optical elements focus the waist of the beam within a nonlinear frequency-doubling crystal or nonlinear optical element or fiber. The nonlinear elements produce a harmonic outside the visible spectrum in the case of crystals, or absorb the laser energy in the case of nonlinear fibers. Embodiments include protectors for the human eye as well as filters for sensitive machinery such as TV cameras, FLIR systems or other imaging equipment. Patents.

0880 Optical Feedback Locking of Semiconductor Lasers
B. Dahmani, L. W. Hollberg
National Inst. of Standards and Technology, Gaithersburg, MD
Filed 18 Oct 88, patented 6 Mar 90 14p
PATENT-4 907 237 Available from Comm. of Patents
An optical method and apparatus is disclosed for stabilizing the frequency of semiconductor lasers. The basic system includes only the optical elements of a conventional semiconductor laser optically coupled to a separate, external resonator having an optical cavity with a particular resonance frequency. The optical geometry is configured such that the output from the resonator is fed back to the laser only when the laser frequency matches or substantially matches the resonance frequency. In other disclosed embodiments, optical electronic feedback loops are used to modulate the laser injection current to stabilize the frequency and to adjust the phase of the optical feedback signal.

Optical Fiber-to-Channel Waveguide Coupler
See 0362

Optical Phase Conjugate Beam Modulator and Method Therefor
See 0364

Optical Shutter Switching Matrix
See 0149

0881 Output Coupler for Laser Resonator
E. A. Lundstrom
Department of the Navy, Washington, DC
Filed 15 Sep 81, patented 17 Jul 84 6p
PATENT-4 461 009 Available from Comm. of Patents
A laser output coupler utilizes a birefrigent lens which has one side thereof curved so as to present a nonuniform polarization distribution across the face of the lens. A polarized beam splitter is employed to separate the output beam from the feedback beam; the feedback beam having a nonuniform distribution across the laser aperture enhances mode discrimination of a pulsed resonator.

Power Transmission Device
See 0368

0882 Pseudo-Random Support Structure for Transmission Gratings
J. F. Meekins
Department of the Navy, Washington, DC
Filed 28 Feb 90 47p
PAT-APPL-7-498 249 Available from NTIS: price code N03
A transmission grating in which the vertical supports are equidistantly spaced from each other in each of the horizontal rows but have their positions relative to each vertical support in all of the other rows determined by a pseudo-random integer of the spacings between the grating wires. As a result, all of the artifacts produced by the vertical supports are eliminated from the diffraction plane. Patent applications.

0883 Reflectometers
K. A. Snail
Department of the Navy, Washington, DC
Filed 9 Oct 87, patented 28 Mar 89 12p
PATENT-4 815 858 Available from Comm. of Patents
Systems for measuring the diffuse reflectances of various samples are constructed to include a primary mirror (e.g., an ellipsoidal mirror) and a secondary mirror (e.g., a compound parabolic concentrator) cooperating with a radiation source, and a radiation detector. Keywords: Patents; Mirrors; Reflectometers; Optical detectors; Diffusion; Ellipsoids; Parabolas.

0884 Room-Temperature, Flashpumped, 1.96 Micron Solid State Laser
G. Quarles, R. Stoneman, L. Esterowitz, C. Marquardt
Department of the Navy, Washington, DC
Filed 23 Dec 89 22p
PAT-APPL-7-459 211 Available from NTIS: price code N03
This patent application is related to the co-pending United States patent application entitled ' A Room-Temperature, Flashpumped, 2 Micron Solid State Laser With High Slope Efficiency', Serial No. (Navy Case No. 72, 360), filed December 22, 1989, both of which applications being commonly assigned to the Government of the United States. The present invention relates to lasers and particularly to a flashpumped solid state laser which operates at a wavelength of 1.96 microns at or near room temperature. Keywords: Patent applications.

0885 Room-Temperature, Flashpumped, 2 Micron Solid State Laser with High Slope Efficiency
G. J. Quarles, L. Esterowitz, C. L. Marquardt
Department of the Navy, Washington, DC
Filed 22 Dec 89 20p
PAT-APPL-7-455 031 Available from NTIS: price code N03
A room temperature solid state laser for producing a laser emission at a wavelength of substantially 2 microns is disclosed. In a preferred embodiment, the laser comprises: a laser crystal having a host crystal material doped with a first effective percent concentration of Cr(3+) sensitizer ions and with a second effective percent concentration of Tm(3+) activator ions; and a flashpump for exciting the laser crystal to produce a laser emission at substantially 2 microns at a slope efficiency of at least 2 percent. Keywords: Patent applications, Inventions.

0886 Room-Temperature, Laser Diode-Pumped, Q-Switched, 2 Micron, Thulium-Doped, Solid State Laser
L. Esterowitz, R. C. Stoneman
Department of the Navy, Washington, DC
Filed 30 Mar 90 18p
PAT-APPL-7-501 461 Available from NTIS: price code N03
A room-temperature, laser-pumped, Q-switched, thulium-doped, solid state laser for producing pulses of laser emission at substantially 2 microns is disclosed. In a preferred embodiment, the laser comprises: a laser cavity defined by first and second reflective path elements opposing each other on a common axis to form a reflective path there between; a laser crystal disposed in the laser cavity, the laser crystal having a host material doped with an amount of thulium activator ions sufficient to produce a laser emission at substantially 2 microns from the 3F4 to 3H6 laser transition in the thulium activator ions when the laser crystal is enabled and is pumped by a CW pump beam at a preselected wavelength; a pump laser for pumping the laser crystal with the CW pump beam at the preselected wavelength; and a Q-switch disposed in the laser cavity between the laser crystal and the second reflective element for periodically enabling the laser crystal to produce a pulsed laser emission at substantially 2 microns when the crystal is also pumped by the CW pump beam. Patent applications.

0887 Rotating Doppler Frequency Shifter
U. H. Lammers, R. A. Marr
Department of the Air Force, Washington, DC
Filed 24 May 88, patented 16 May 89 6p
PATENT-4 830 479 Available from Comm. of Patents
A rotating Doppler Frequency shifter comprises spiral members which surrounded a first mirror affixed to a rotating shaft, and a second mirror affixed to an arm which extends from the shaft and rotates therewith. Each spiral member has a reflective inner surface which is shaped such as to reflect a signal impinging thereon back along its entry path. This arrangement provides for a continuous Doppler frequency shifting of the input signal. Patents.

Serial Interferometric Fiber-Optic Sensor Array
See 0374

0888 Small Angle Generating Apparatus
R. J. Magee, J. P. Marchi
Department of the Navy, Washington, DC
Filed 5 Jul 88, patented 2 Jan 90 5p
PATENT-4 890 917 Available from Comm. of Patents
A small angle generating apparatus is described for deviating optical beams by accurately measureable small angles to calibrate autocollimators or the like. It includes a double mirror combination which is mounted on an elongated mechanical beam which is rotatable about a pivot at one end of the beam by means of a micrometer coupled at the opposite end thereof. Rotation of the double mirror combination deviates a beam of light from a test autocollimator from its original position either horizontally or vertically through a small angle which is linearly proportional to the angular rotation of the mechanical beam. Keywords: Patents; PAT-CL-356-138.

Tailorable Infrared Sensing Device with Strain Layer Superlattice Structure
See 0379

Thermal Modulation of Light Beams
See 0382

0889 Three-Mirror Active-Passive Semiconductor Laser
E. M. Garmire, G. A. Evans, W.
Department of the Navy, Washington, DC
Filed 7 Jun 82, patented 11 Dec 84 8p
PATENT-4 488 307 Available from Comm. of Patents
Disclosed is a GaAlAs laser diode wherein an abrupt etch step in the waveguide layer forms a third mirror. The structure is a large optical cavity double heterostructure laser having a relatively long active cavity and a relatively short passive cavity. Output is temperature and current sensitive for single mode operation, widely spaced dual mode operation, and narrow-band multimode operation. Keywords: Patents, PAT-CL-372-50.

0890 Thulium-Doped Fluorozirconate Fiber Laser Pumped by a Diode Laser Source
R. Allen, L. Esterowitz
Department of the Navy, Washington, DC
Filed 28 Feb 90 15p
PAT-APPL-7-486 638 Available from NTIS: price code N03
The present invention relates to lasers and particularly to a diode-pumped, fiber laser doped with thulium activator ions for producing an output CW laser emission at a wavelength of substantially 2.3 microns. In low power applications, such as in telecommunications and in medical and sensing applications, the use of fiber lasers is becoming more and more important. In a typical fiber laser a rare earth, such as erbium, neodymium, terbium or praseodymium, is doped into the core of an optical fiber to provide an active gain medium for the fiber laser. Typically, the optical fiber is comprised of silica. Keywords: Patent applications.

0891 Tunable, Continuous Wave, Thulium-Doped, Solid State Laser Cross-Reference to Related Application
L. Esterowitz, R. C. Stoneman
Department of the Navy, Washington, DC
Filed 30 Mar 90 21p
PAT-APPL-7-510 499 Available from NTIS: price code N03
One object of the invention is to produce a room-temperature, CW laser emission continuously tunable over the spectral range of 1.86 to 2.14 microns. Another object of the invention is to provide a compact, economical, laser-pumped, solid state laser for producing a CW laser emission tunable over the spectral range of substantially 1.86 to 2.14 microns. Another object of the invention is to provide a room-temperature, laser-pumped, thulium-doped, solid state laser for producing a CW laser emission tunable over the spectral range of 1.86 to 2.14 microns and method for operating same. Another object of the invention is to provide a room-temperature, laser diode-pumped, thulium-doped, solid state laser for producing a CW laser emission tunable over the spectral range of 1.86 to 2.14 microns. Keywords: Patent applications.

Wave guide impedance matching method and apparatus
See 0385

0892 X-ray Laser with Enhanced X-ray Gain Through Photodepopulation
R. C. Elton
Department of the Navy, Washington, DC
Filed 29 Sep 89 15p
PAT-APPL-7-414 499 Available from NTIS: price code N03

The present invention relates to x-ray lasers employing hydrogenic lasing ions of nuclear charge Z, for n=2 to 4 or 6 excitation, and radiating ions of nuclear charge Z/2 for decreasing the n=2 population density of the hydrogenic lasing ions of nuclear charge Z. It is an object of the invention to increase the population inversion and gain to saturation, to improve the overall efficiency, and to increase the plasma size by decreasing the population density N2. Keywords: X-ray laser with enhanced x-ray gain photodepopulation.

PHYSICS: Other

Acoustic Intensity Probe
See 0180

Adaptive Polarization Diversity Detection Scheme for Coherent Communications and Interferometric Fiber Sensors
See 0140

Adjustable Twister
See 0249

0893 Aligned Bismuth, Strontium, Calcium Cuprate Coatings on Polycrystalline Substrates
L. Toth, J. R. Spann
Department of the Navy, Washington, DC
Filed 21 Mar 90 25p
PAT-APPL-7-497 175 Available from NTIS: price code N03

The present invention relates in general to a process for forming thick film superconducting coatings on a polycrystalline substrate and, more particularly, to a process for forming a thick film of BiaSrbCacCudOx(BSCCO) on a polycrystalline substrate. A process is provided for forming an oriented thick film superconducting coating on a polycrystalline substrate, the coating comprising at least two highly oriented components. The process is a powdered mixture prepared from Bi2O3, SrCO3, CaCO3, and CuO onto a polycrystalline substrate; rapidly heating the resultant coated substrate to a temperature of from about 1000-1100 C for a period of from about 5-30 minutes, thereby melting the powder and forming a thick film coating; rapidly quenching the coated substrate to below 500 C, which is below the temperature at which phase transition occurs. Patent applications.

0894 Apparatus and Method for Characterizing the Transmission Efficiency of a Mass Spectrometer
S. Srivasytava
National Aeronautics and Space Administration, Pasadena, CA. Pasadena Office
Filed 26 May 89 19p
PAT-APPL-7-358 027 Available from NTIS: price code A03

An electron/ion coincidence technique is employed to characterize the absolute mass dependent transmission efficiency of mass spectrometers. The technique is not dependent upon the partial pressure of the sample beam or the ionization cross sections of calibrant gases.

0895 Apparatus for Mixing Solutions in Low Gravity Environments
D. C. Carter, M. B. Broom
National Aeronautics and Space Administration, Huntsville, AL. George C. Marshall Space Flight Center
Filed 15 Sep 88, patented 20 Mar 90 8p
PATENT-4 909 933 Available from Comm. of Patents

An apparatus is disclosed for allowing mixing of solutions in low gravity environments so as to carry out crystallization of proteins and other small molecules or other chemical syntheses, under conditions that maximize crystal growth and minimize disruptive turbulent effects. The apparatus is comprised of a housing, a plurality of chambers, and a cylindrical rotatable valve disposed between at least two of the chambers, said valve having an internal passageway so as to allow fluid movement between the chambers by rotation of the valve. In an alternate embodiment of the invention, a valve is provided having an additional internal passage way so that fluid from a third chamber can be mixed with the fluids of the first two chambers. This alternate embodiment of the invention is particularly desirable when it is necessary to provide a termination step to the crystal growth, or if a second synthetic step is required.

Coaxial Probe for Measuring the Current Density Profile of Intense Electron Beams
See 0314

0896 Colinear Fluctuating Wall Shear Stress and Fluctuating Pressure Transducer
W. L. Keith
Department of the Navy, Washington, DC
Filed 25 Apr 88, patented 8 Aug 89 6p
PATENT-4 854 174 Available from Comm. of Patents

This patent discloses a unique combination of two transducers. A hot film shear stress gauge and a piezoelectric pressure transducer are coaxially located along the longitudinal centerline of a cylindrical metal shell. The hot film shear stress gauge is exposed to the fluid while the pressure transducer is positioned directly below. Conductors are attached to each and the remaining volume filled with plastic to form a colinear unit. The conductors attached to the hot film element provide power while the conductors attached to the piezoelectric transducer transmit pressure produced electrical signals therefrom. The resulting configuration allows the measurement of fluctuating shear stress and fluctuating pressure to be made simultaneously at a single spatial location at a solid wall bounding a turbulent fluid flow layer.

Design and Fabrication Sequence for InP Junction FETS and Junction HEMTS
See 0276

Detection of Oxygen in Thin Films
See 0040

0897 Double Valve Mechanism for an Acoustic Modulator
R. B. Anderson
Department of the Navy, Washington, DC
Filed 23 Aug 89 17p
PAT-APPL-7-397 549 Available from NTIS: price code N03

A double valve mechanism is the functioning part of an acoustic modulator which regulates airflow by creating air pressure variations. A pair of cylindrical shaped members, each of which has a plurality of elongated ports therein move relative to each other through electro-magnetic excitation. The motion of the two cylindrical shaped members is reciprocating causing the ports to first open and then close, thereby modulating the air flowing through the acoustic modulator. Linear motion of the cylindrical shaped members to displace the same port area is only one half of the linear motion required in a previous design, resulting in an

acoustic energy output waveform having a frequency which is double the frequency of an electrical sinusoidal input signal supplied to the acoustic modulator. Patent applications.

Double Valve Mechanism for an Acoustic Modulator
See 0449

Dual Cathode System for Electron Beam Instruments
See 0320

Edge Geometry Superconducting Tunnel Junctions Utilizing an Nbn/Mgo/Nbn Thin Film Structure
See 0251

0898 Electron Paramagnetic Resonance Instrument with Superconductive Cavity
L. J. Jasper
Department of the Army, Washington, DC
Filed 16 Nov 89 16p
PAT-APPL-7-437 401 Available from NTIS: price code N03
The EPR instrument includes an X band klystron used to generate microwave power that is transmitted to a superconductive waveguide cavity resonator. The cavity is placed between the pole pieces of a large d-c magnet and small a-c magnetic coils energized by a modulation signal source. A microwave crystal detector detects RF energy emitted from the cavity. The detector output is amplified, rectified and filtered in a phase sensitive filter that uses the modulation signal source as a reference. The resultant signal is recorded by an amplitude vs. time recorder. The superconductive cavity includes an inner wall of high-temperature superconductive material, a liquid coolant and an insulating sleeve that passes through the cavity. The specimen to be analyzed is placed in the sleeve. Patents application.

Enhanced Magnetic Field within Enclosed Annular Cavity
See 0253

Enhanced Magnetic Field within Enclosed Cylindrical Cavity
See 0254

0899 Fabrication of Nanometer Single Crystal Metallic CoSi2 Structures on Si
S. K. W. Nieh, T. Lin, R. W. Fathauer
National Aeronautics and Space Administration, Pasadena, CA. Pasadena Office
Filed 10 Aug 89 12p
PAT-APPL-7-392 166 Available from NTIS: price code N03
Amorphous Co:Si (1:2 ratio) films are electron gun-evaporated onto clean Si(111) substrates, such as in a molecular beam epitaxy system. These layers are then crystallized selectively with a focused electron beam to form very small crystalline CoSi2 regions in an amorphous matrix. Finally, the amorphous regions are etched away selectively using plasma or chemical techniques.

Fabrication of NbN Based Electronic Devices with Silicon Barriers
See 0256

0900 Fabrication of Permanent Magnet Toroidal Rings
H. A. Leupold
Department of the Army, Washington, DC
Filed 3 Nov 89 19p
PAT-APPL-7-431 278 Available from NTIS: price code N03
A hollow cylindrical flux source (HCFS) is formed into a toroidal shape. A hollow toroid of magnetically neutral material is mounted in the central cavity of the toroidal flux source. The hollow toroid has a central coaxial toroidal cavity of given cross-section (e.g., rectangular). The toroid flux source and the hollow toroid are each equatorially split into two halves. When the two halves are brought into juxtaposition and a suspension of magnetic material is deposited in the coaxial toroidal cavity a permanent magnet toroidal ring will be fabricated. Patent applications.

0901 Fast Grid Generation
S. Jordan
Department of the Navy, Washington, DC
Filed 31 Oct 89 20p
PAT-APPL-7-432 108 Available from NTIS: price code N03
This patent application discloses a method for a fast and efficient grid generation to study the interaction of a moving body with a fluid in which it is traveling. The method includes setting up a grid including the grid generating equations based upon the flow equations in the fluid flow domain of interest. The grid generating equations are solved numerically using Newton's method and modified strongly implicit (MSI) method by going through a series of iterations determined by the thresholds on the error functions involved.

0902 Fatigue Testing Apparatus
R. J. Buzzard
National Aeronautics and Space Administration, Cleveland, OH. Lewis Research Center
Filed 21 Aug 89, patented 17 Apr 90 8p
PATENT-4 916 954 Available from Comm. of Patents
An apparatus is provided for obtaining a single crack in fatigue loading which emanates from a predetermined starting notch in a test specimen. This crack propagates in a direction in line with that of the applied Mode 2 load. The loading may be performed either monotonically or in a cyclic fatigue.

Formation of Epitaxial Si-Ge Heterostructures
See 0279

0903 Formation of High T(c) Superconducting Films by Organometallic Chemical Vapor Deposition
A. Berry, D. Gaskill, R. Holm, E. Cukauskas
Department of the Navy, Washington, DC
Filed 16 May 89 25p
PAT-APPL-7-352 325 Available from NTIS: price code N03
This invention relates to a method of forming high Tc superconducting films by organometallic chemical vapor deposition. More specifically, this invention relates to a method of forming superconducting films on a semiconductor surface by chemical vapor deposition of volatile organometallic compounds of the rare earth and alkaline earth elements, and copper. Keywords: Reports, Periodicals, Military publications, Scientific literature.

Frequency Independent Constant Beamwidth Directional Lens Antenna for Very Wideband and Multi-Channel Electromagnetic Communications
See 0327

0904 Gas Separation with Rotating Plasma Arc Reactor
D. Hollis, J. McLendon, D. Broderick
Department of the Interior, Washington, DC
Filed 9 Feb 90 25p
PAT-APPL-7-477 395 Available from NTIS: price code N03

The invention pertains to the use of rotating plasma arc reactors to effect a one stage separation or enrichment of a gas component from a composite gas at a plasma rotational or angular speed of at least 60,000 rpm.

High Quality Tunnel Junction Devices Using High T(c) Superconductors
See 0260

0905 High Resolution Technique and Instrument for Measuring Lattice Parameters in Single Crystals
M. Fatemi
Department of the Navy, Washington, DC
Filed 28 Feb 90 39p
PAT-APPL-7-486 324 Available from NTIS: price code N03
A method of measuring the lattice parameter in an unknown single crystal by comparing its diffraction angle to a standard single crystal, on a double-crystal diffractometer is disclosed. The method comprises several steps including mounting the unknown and standard crystals on a mounting block of the second stage of a double-crystal diffractometer such that a tilt axis of the crystal surface is in line with an x-ray beam and the azimuth axis of the second stage crystal mount, rotating the mounting block until the normals of the crystals have equal vertical components, tilting the crystals about the azimuth axis of the mounting block until the crystal normals lie in the horizontal plane in line with the x-ray beam, such that the same point on the crystal surface remains fixed in the x-ray beam, sequentially measuring the angle of the sharpest diffraction peak from each crystal while moving the crystals laterally across the beam, rotating the crystal mounting block assembly by 180 degrees about the azimuth axis while maintaining the relative tilt between the two wafers, such that the same area of the crystal surface remains in the x-ray beam during the 180 degrees rotation, sequentially measuring the angle of sharpest diffraction peak of both crystals after rotation, and calculating the diffraction angle of the unknown crystal from the standard crystal diffraction angle. Patent Applications.

0906 High T(c) Copper-Oxide Superconductors
W. L. Lechter, M. S. Osofsky, E. Skelton
Department of the Navy, Washington, DC
Filed 8 Nov 89 11p
PAT-APPL-7-433 245 Available from NTIS: price code N03
High T sub C superconducting compounds are made by forming a reaction mixture of the oxides of Sr, Cu, Ca and Tl, compressing these into a hardened body, and placing the hardened body into a container. The container is then evacuated and sealed. The hardened body is heated under pressure until the oxides of Sr, Ca, Cu, and Tl react to form a superconducting compound. Patent applications.

0907 High voltage pulse conditioning
R. M. Stringfield, R. M. Wheat
Los Alamos National Lab., NM.; Department of Energy, Washington, DC
Filed 21 Feb 89 11p
PAT-APPL-7-313 201 Available from NTIS: price code A03
Apparatus for conditioning high voltage pulses from particle accelerators in order to shorten the rise times of the pulses. Flashover switches in the cathode stalk of the transmission line hold off conduction for a determinable period of time, reflecting the early portion of the pulses. Diodes upstream of the switches divert energy into the magnetic and electrostatic storage of the capacitance and inductance inherent to the transmission line until the switches close.

Impact Tolerant Material
See 0553

Low Loss Electro-Optic Modulator Mount
See 0339

0908 Magnetostrictive Torque Sensor
H. T. Savage, A. E. Clark, M. Wun-fogie, L. T. Kabacoff, A. Herando
Department of the Navy, Washington, DC.; National Aeronautics and Space Administration, Washington, DC
Filed 21 Jun 89 14p
PAT-APPL-7-374 112 Available from NTIS: price code A03
Magnetostrictive wire having a low surface-to-volume ratio established by a constant non-planar cross-section, is helically deformed into contact with a shaft under a stress maintaining the wire in fixed relation to the shaft surface. Magnetic anisotropy is imparted to the wire by twist thereof about its cross-sectional axis while the wire is being helically deformed into contact with the shaft surface to form a torque sensor through which accurate torque detection is achieved.

0909 Method and Apparatus for Detecting Laminar Flow Separation and Reattachment
J. P. Stack, S. M. Mangalam
National Aeronautics and Space Administration, Hampton, VA. Langley Research Center
Filed 7 Jun 88, patented 18 Jul 89 13p
PATENT-4 848 153 Available from Comm. of Patents
The invention is a method and apparatus for detecting laminar flow separation and flow reattachment of a fluid stream by simultaneously sensing and comparing a plurality of output signals, each representing the dynamic shear stress at one of an equal number of sensors spaced along a straight line on the surface of an airfoil or the like that extends parallel to the fluid stream. The output signals are concurrently compared to detect the sensors across which a reversal in phase of said output signal occurs, said detected sensors being in the region of laminar separation or reattachment. The novelty in this invention is the discovery and use of the phase reversal phenomena to detect laminar separation and attachment of a fluid stream from any surface such as an airfoil supported therein.

0910 Method and system for improved resolution of a compensated calorimeter detector
J. W. Dawson
Argonne National Lab., IL.; Department of Energy, Washington, DC
Filed 23 May 89 16p
PAT-APPL-7-355 522 Available from NTIS: price code A03
An improved method and system for a depleted uranium calorimeter detector was used in high energy physics experiments. In a depleted uranium calorimeter detector, the energy of a particle entering the calorimeter detector is determined and the output response of the calorimeter detector is compensated so that the ratio of the integrated response of the calorimeter detector from a lepton to the integrated response of the calorimeter detector from a hadron of the same energy as the lepton is approximately equal to 1. In the present invention, the energy of a particle entering the calorimeter detector is determined as a function of time and the hadron content of the response of the

calorimeter detector is inferred based upon the time structure of the energy pulse measured by the calorimeter detector. The energy measurement can be corrected based on the inference of the hadron content whereby the resolution of the calorimeter can be improved. 2 figs.

0911 Method for Growing Patterned Thin Films of Superconductors
H. Lessoff, R. F. Greene
Department of the Navy, Washington, DC
Filed 23 Nov 87, patented 27 Jun 89 6p
PATENT-4 843 060 Available from Comm. of Patents
A method for growing a patterned superconductive oxide film of the general formula XZ2Cu3O6+x is disclosed, wherein X is yttrium, a lanthanide or a mixture thereof, Z is one or more alkaline earth elements and x is a number between 0 and 1. This patterned superconductive oxide film of XZ2Cu3O6+x is formed by preparing an aqueous solution of the nitrates of X, Z and Cu in the X;Z;Cu stoichiometric ratio of 1;2;3; spraying the aqueous nitrate solution onto a heated substrate to form on the substrate a thin film of XZ2Cu3Oy material, wherein y is an undefined number; spot-heating preselected portions of the thin film in an oxygen-rich atmosphere to convert the preselected portions into the patterned superconductive oxide film of XZ2Cu3O6+x; and removing the unheated thin film of XZ2Cu3Oy material with a solvent. Patents.

Method for thermal processing alumina-enriched spinel single crystals
See 0609

0912 Method of Controlling Discharge of Stored Electric Charge in Plastic Objects and Forming Lichtenberg Figures in Plastic Objects
J. M. Mendonca
Department of the Air Force, Washington, DC
Filed 22 Feb 88, patented 1 Aug 89 5p
PATENT-4 853 163 Available from Comm. of Patents
A method prevents the spontaneous discharge of charged dielectric objects such that the surface of the objects are polished smooth to remove down to microscopic surface faults thereon. A maximum charge is storable therein having only loss by corona leakage from edges of the object. This method allows for a controlled discharge to create Lichtenberg figures therein. Artistic objects are also made by a method of coloration of the figure in the objects. Patents.

Method of Forming a Multiple Layer Dielectric and a Hot Film Sensor Therewith
See 0284

Method of Forming Low Cost, Formable High T(Subc) Superconducting Wire
See 0343

0913 Method of Preparing Radially Homogeneous Mercury Cadmium Telluride Crystals
S. L. Lehoczky, F. R. Szofran
National Aeronautics and Space Administration, Huntsville, AL. George C. Marshall Space Flight Center
Filed 17 Dec 85, patented 5 Sep 89 6p
PATENT-4 863 553 Available from Comm. of Patents
Hg(1-x)Cd(x)Te is prepared in an improved directional solidification method in which a precast alloy sample containing predetermined amounts of Hg, Cd, and Te is disposed in a sealed ampule and a furnace providing two controlled temperature zones is translated upward past the ampule to provide melting and resolidification. The present improvement is directed to maintaining the zones at temperatures determined in accordance with a prescribed formula providing a thermal barrier between the zones with a maximum thickness and translating the furnace past the zones at a rate less the 0.31 micron/sec.

Method of Preparing Superconducting 'Orthorhomibic' - Type Compounds in Bulk Using C1-C6 Alkanoic Acid Salts
See 0112

Method of Producing a Thin Silicon-on-Insulator Layer
See 0287

0914 Methods of and system for swing damping movement of suspended objects
J. F. Jones, B. J. Petterson, D. R. Strip
Sandia National Labs., Albuquerque, NM.; Department of Energy, Washington, DC
Filed 20 Apr 89 52p
PAT-APPL-7-341 087 Available from NTIS: price code A04
A payload suspended from a gantry is swing damped in accordance with a control algorithm based on the periodic motion of the suspended mass or by serving on the forces induced by the suspended mass.

Multiple channel programmable coincidence counter
See 0431

0915 Neutron-driven gamma-ray laser
C. D. Bowman
Los Alamos National Lab., NM.; Department of Energy, Washington, DC
Filed 28 Mar 89 14p
PAT-APPL-7-329 710 Available from NTIS: price code A03
A lasing cylinder emits laser radiation at a gamma-ray wavelength of 0.87 (angstrom) when subjected to an intense neutron flux of about 400 eV neutrons. A 250 (angstrom) thick layer of Be is provided between two layers of 100 (angstrom) thick layer of (sup 57)Co and these layers are supported on a foil substrate. The coated foil is coiled to form the lasing cylinder. Under the neutron flux (sup 57)Co becomes (sup 58)Co by neutron absorption. The (sup 58)Co then decays to (sup 57)Fe by 1.6 MeV proton emission. (sup 57)Fe then transitions by mesne decay to a population inversion for lasing action at 14.4 keV. Recoil from the proton emission separates the (sup 57)Fe from the (sup 57)Co and into the Be, where Mossbauer emission occurs at a gamma-ray wavelength.

Noise-Suppressing Hydrophones
See 0522

0916 Noise-Suppressing Hydrophones
M. Kahn
Department of the Navy, Washington, DC
Filed 30 Jun 89, patented 22 May 90 7p
PATENT-4 928 264 Available from Comm. of Patents
A hydrophone mounted on the hull of a ship comprises an electromechanical transducer made of void-containing ceramic material having a high piezoelectric sensitivity to water-borne acoustic sound signals, a transducer made of solid ceramic material having a low piezoelectric sensitivity to hydrostatic acoustic signals, both transducers having similar piezoelectric sensitivity to a shipboard noise transmitted via the ship's hull and transducer mounting; and means for sensing and manipulating voltage signals generated in response to water-borne acoustic signals and

mount-transmitted shipboard noise such that the mount transmitted noise signals are largely cancelled out and a relatively noise-free signal representing hydrostatically transmitted sound is obtained. Patents.

Organometallic Antimony Compounds Useful in Chemical Vapor Deposition Processes
See 0086

Overlap Correlator Synthetic Aperture Processor
See 0183

0917 Oxidation of Semiconductors and Superconductors
R. P. Vasquez
National Aeronautics and Space Administration, Pasadena, CA. Pasadena Office
Filed 30 Dec 88 14p
PAT-APPL-7-292 141 Available from NTIS: price code A03

A process and apparatus are disclosed for low temperature oxidation of a substrate such as a semiconductor or superconductor. The oxidation of the substrate is achieved through the use of an excited state of oxygen in contact with the said substrate. The apparatus includes a chamber for holding the substrate and means for providing oxygen in an excited state to the chamber and substrate.

Passivating Layer for III-V Semiconductor Materials
See 0293

0918 Periodic Permanent Magnet Structures
H. A. Leupold
Department of the Army, Washington, DC.; National Aeronautics and Space Administration, Washington, DC
Filed 3 Jul 89 14p
PAT-APPL-7-375 218 Available from NTIS: price code A03

Periodic permanent magnet structures comprise a plurality of paired axially aligned sections of hollow spherical flux sources each of which produces a uniform high-field in its central cavity. Each pair of sections is mounted on opposite sides of a respective plate of permeable material. The magnetic field orientations in the central cavities are axially directed and alternate or reverse in direction from section to section. An axial bore hole drilled through the sections and plates provides a continuous channel or path through which a beam of charged particles will travel.

0919 Periodic Permanent Magnetic Structure for Accelerating Charged Particle
H. A. Leupold
Department of the Army, Washington, DC
Filed 23 Oct 89 14p
PAT-APPL-7-425 548 Available from NTIS: price code N03

HSFS's or magic spheres are adapted for use in periodic permanent magnet structures to derive magnetic fields of greater uniformity and average magnitude perpendicularly across an axis along which charged particles are directed in devices, such as radiation sources. Keywords: Hollow spherical flux sources, Periodic permanent magnets, Patent applications.

Permanent Magnet Field Sources of Conical Orientation
See 0268

0920 Process for Single Crystal Growth of High T(Sub C) Superconductors
W. Lechter, L. Toth, D. Badri
Department of the Navy, Washington, DC.; National Aeronautics and Space Administration, Washington, DC
Filed 25 May 89 11p
PAT-APPL-7-356 496 Available from NTIS: price code A03

Large oriented crystals greater than one millimeter in length of high T(sub c) superconducting compounds are grown by mixing starting materials in the correct proportions to make the superconducting compound, forming a mixture. The CO2 is removed from the mixture and the ternary oxide of the compound is formed from the mixture. Next, the mixture is formed into a self-supporting green body and sintered at a sintering temperature at which the top of the self supporting green body is molten and the bottom surface is solid. The self-supporting green body is held at the sintering temperature for a time, forming a sintered body. Next, the sintered body is cooled so that crystals form. After this step, the crystals can be further processed to increase their superconducting properties. Finally, the crystals are removed and processed for use.

0921 Pulsed field sample neutralization
A. D. Appelhans, D. A. Dahl, J. E. Delmore
EG and G Idaho, Inc., Idaho Falls.; Department of Energy, Washington, DC
Filed 5 Jul 89 27p
PAT-APPL-7-375 442 Available from NTIS: price code A03

An apparatus and method for alternating voltage and for varying the rate of extraction during the extraction of secondary particles, resulting in periods when either positive ions, or negative ions and electrons are extracted at varying rates. Using voltage with alternating charge during successive periods to extract particles from materials which accumulate charge opposite that being extracted causes accumulation of surface charge of opposite sign. Charge accumulation can then be adjusted to a ratio which maintains a balance of positive and negative charge emission, thus maintaining the charge neutrality of the sample. 3 figs.

Reflection Technique for Thermal Mapping of Semiconductors
See 0294

SAW (Surface Acoustic Wave) Transducer with Improved Bus-Bar Design
See 0271

0922 Scanning Electron Microscopy by Photovoltage Contrast Imaging
L. D. Flesner
Department of the Navy, Washington, DC
Filed 18 May 89, patented 20 Feb 90 6p
PATENT-4 902 967 Available from Comm. of Patents

A process and apparatus are disclosed for remotely determining electrical properties of a semiconductor. A surface of the semiconductor is simultaneously irradiated with an electron beam to generate secondary electrons from the irradiated surface and with a modulated light beam. Secondary electrons emitted by the semiconductor are filtered by an electron energy analyzer. An electron detector receives the filtered electrons and provides an output corresponding to electrical properties of the irradiated area. The output is provided to a computer which calculates the difference in output between periods when the semiconductor is being il-

luminated with the light beam and when it is not so illuminated. The time dependence of the output may also be measured. Patents.

0923 Sound Attenuation Apparatus
K. P. Shepherd, M. W. A. F. Grosveld
National Aeronautics and Space Administration, Hampton, VA. Langley Research Center
Filed 10 Aug 89 11p
PAT-APPL-7-392 165 Available from NTIS: price code N03
An apparatus is disclosed for reducing acoustic transmission from mechanical or acoustic sources by means of a double wall partition, within which an acoustic pressure field is generated by at least one secondary acoustic source. The secondary acoustic source is advantageously placed within the partition, around its edges, or it may be an integral part of a wall of the partition.

0924 Spark gap switch with spiral gas flow
J. P. Brucker
Los Alamos National Lab., NM.; Department of Energy, Washington, DC
Filed 23 Mar 88 12p
PAT-APPL-7-172 096 Available from NTIS: price code A03
A spark gap switch having a contaminate removal system using an injected gas. An annular plate concentric with an electrode of the switch defines flow paths for the injected gas which form a strong spiral flow of the gas in the housing which is effective to remove contaminates from the switch surfaces. The gas along with the contaminates is exhausted from the housing through one of the ends of the switch.

Synthesis and Polymerization of Dithioether-Linked Phthalonitrile Monomers
See 0099

0925 System for Venting Gas from a Liquid Storage Tank
R. E. Dugan
National Aeronautics and Space Administration, Houston, TX. Lyndon B. Johnson Space Center
Filed 30 Sep 88, patented 11 Jul 89 8p
PATENT-4 846 854 Available from Comm. of Patents
Gas is vented from a non-cryogenic liquid storage tank while discharging pressurized liquid from a tube into the tank through a plurality of inclined jets, circumferentially spaced about an end of a vent tube positioned within the tube. Each jet is directed toward a central axis of the vent tube, such that the end of the vent tube receives gas from the vessel passing between individual jetstreams, which in combination form a conical shaped barrier to liquid droplets which would otherwise also pass to the vent tube and out the tank. Gas is thus vented through the central tube while pressurized liquid flows in an axially opposite direction in the annulus between the inner vent tube and the outer liquid tube. The system of the present invention is prarticularly well suited for venting gas from a tank being replenished with liquid at a zero or near zero gravity environment. A screen-type liquid acquisition device employing surface tension is provided for withdrawing substantially liquid from the tank. The withdrawn liquid may be resupplied to the liquid tube under pressure supplied by a circulating pump, thereby releasing substantially only gas from the storage tank to reduce the pressure in the tank.

Temperature Compensated Crystal Oscillator (TCXO) with Improved Temperature Compensation
See 0240

Thermal Modulation of Light Beams
See 0382

Thin-Film Integrated Injection Logic
See 0299

0926 Three-Dimensional Laser Velocimeter Simultaneity Detector
J. L. Brown
National Aeronautics and Space Administration, Moffett Field, CA. Ames Research Center
Filed 14 Oct 88, patented 15 May 90 17p
PATENT-4 925 297 Available from Comm. of Patents
A three-dimensional laser Doppler velocimeter has laser optics for a first channel positioned to create a probe volume in space, and laser optics and for second and third channels, respectively, positioned to create entirely overlapping probe volumes in space. The probe volumes and overlap partially in space. The photodetector is positioned to receive light scattered by a particle present in the probe volume, while photodetectors and are positioned to receive light scattered by a particle present in the probe volume. The photodetector for the first channel is directly connected to provide a first channel analog signal to frequency measuring circuits. The first channel is therefore a primary channel for the system. Photodetectors and are respectively connected through a second channel analog signal attenuator to frequency measuring circuits and through a third channel analog signal attenuator to frequency measuring circuits. The second and third channels are secondary channels, with the second and third channels analog signal attenuators and controlled by the first channel measurement burst signal on line. The second and third channels analog signal attenuators and attenuate the second and third channels analog signals only when the measurement burst signal is false.

0927 Trochoidal Analysis of Scattered Electrons in a Merged Electron-Ion Beam Geometry
A. Chutjian
National Aeronautics and Space Administration, Pasadena, CA. Pasadena Office
Filed 11 Feb 88, patented 4 Apr 89 10p
PATENT-4 818 868 Available from Comm. of Patents
The method and apparatus of this invention provides a plurality of measurements indicative of the absolute cross section for excitation of an ion beam. The ion beam is merged for excitation by specific energies of electrons in an electron beam. Both beams are merged in an evacuated enclosure having a longitudinal magnetic field and a crossed uniform electric field. The ions and electrons interact over a known merged longitudinal length in a merged beam area. After collision, the electron and ion beams are demerged. Forward and backward-scattered electrons are collected and position-detected by a pair of microchannel plate arrays located at opposite ends of said longitudinal beam-merging area. A series of electron and ion primary current measurements are taken at full ion and electron beam strength. Measurements are also taken at greatly reduced beam strength to obtain a beam overlap profile.

Ultrasonic Assisted Paint Removal Method
See 0544

Ultrasonic Flotation System
See 0838

Vibration and Shock Resistant Heat Exchanger
See 0529

Wave guide impedance matching method and apparatus
See 0385

TRANSPORTATION: Aircraft

0928 Actuated Forebody Strakes
D. G. Murri
National Aeronautics and Space Administration, Hampton, VA. Langley Research Center
Filed 11 May 88, patented 17 Apr 90 11p
PATENT-4 917 333 Available from Comm. of Patents
Actuated forebody strakes provide yaw control at high angles of attack. In one embodiment, the strakes are axially slidable in the forebody to be deployed out of slots provided for the strakes in the forebody. In another embodiment, the strakes are pivotally connected at the tip of the strakes to pivot radially outwardly out of the slots provided in the forebody. In another embodiment, the forebody is provided with either a single strake or two strakes and the forebody is rotatable to vary the radial location of the strake or strakes. All embodiments achieve significant yaw control capability over a wide angle of attack and sideslip ranges.

Aluminum Alloy
See 0574

0929 Compression Pylon
J. C. Patterson
National Aeronautics and Space Administration, Hampton, VA. Langley Research Center
Filed 23 Jun 88, patented 19 Sep 89 10p
PATENT-4 867 394 Available from Comm. of Patents
A compression pylon for an aircraft with a wing-mounted engine, that does not cause supersonic airflow to occur within the fuselage-wing-pylon-nacelle channel is presented. The chord length of the pylon is greater than the local chord length of the wing to which it is attached. The maximum thickness of the pylon occurs at a point corresponding to the local trailing edge of the wing. As a result, the airflow through the channel never reaches supersonic velocities.

0930 Helmet-Mounted Head Restraint
M. H. Patterson
Department of the Navy, Washington, DC
Filed 3 Nov 88, patented 20 Mar 90 4p
PATENT-4 909 459 Available from Comm. of Patents
This patent discloses a head restraint for the occupant of a vehicle seat. It restrains the forward and downward movement of the occupant's head when subjected to large deceleration forces. The restraint includes a strap assembly which encircles the back of the occupant's head and releasably connects to his helmet adjacent to each of his ears at two locations. A retaining strap is slidably connected by a loop to the strap assembly and extends behind the head to a retracting means fixed in the seat. The retracting means pulls the head back against the seat when the deceleration forces exceed a predetermined level, as during flight maneuvers. During normal flight conditions, the occupant is able to move his head freely from side to side as the strap assembly slides through the loop. Keywords: Patents, PAT-CL-244/122, Protective equipment, Flight crews.

Lightweight Ceramic Insulation and Method
See 0604

0931 Low-Cost, Expendable, Crushable Target Aircraft
J. S. Attinello, D. G. Rousseau
Department of the Navy, Washington, DC
Filed 16 Mar 84, patented 12 Sep 89 4p
PATENT-4 865 328 Available from Comm. of Patents
An expendable drone aircraft to be used as a target for advanced weapons platforms is made of a lightweight crushable foam material. The drone is adapted to realistically converge upon the weapons platform so as to activate the tracking/fire control sensors thereof. A solid fuel rocket motor is encased in a non-metallic lightweight housing and is used to power the drone in free flight. A simple optical seeking device is used to input a signal to a guidance control system which directs the drone in free flight to converge upon the weapons platform. If the weapons platform fails to neutralize the drone during convergence, the impact hazard of the drone is neutralized by the lightweight crushable foam material which acts to harmlessly absorb the kinetic energy of the drone thereby minimizing danger to equipment and personnel of the weapons platform. Patents. PAT-CL-273-362.

0932 Miniaturization of Flight Deflection Measurement System
R. Fodale, H. R. Hampton
National Aeronautics and Space Administration, Hampton, VA. Langley Research Center
Filed 30 Sep 88, patented 30 Jan 90 6p
PATENT-4 896 533 Available from Comm. of Patents
A flight deflection measurement system is disclosed including a hybrid microchip of a receiver/decoder. The hybrid microchip decoder is mounted piggy back on the miniaturized receiver and forms an integral unit therewith. The flight deflection measurement system employing the miniaturized receiver/decoder can be used in a wind tunnel. In particular, the miniaturized receiver/decoder can be employed in a spin measurement system due to its small size and can retain already established control surface actuation functions.

0933 Passive Venting Technique for Shallow Cavities
R. L. Stallings, F. J. Wilcox
National Aeronautics and Space Administration, Hampton, VA. Langley Research Center
Filed 30 Sep 88, patented 5 Sep 89 5p
PATENT-4 863 118 Available from Comm. of Patents
A device is introduced for reducing drag and store separation difficulties caused by shallow cavities on aircraft in supersonic flight consisting of a group of hollow pipes the same length as the cavity. The pipes are attached to the cavity floor so as to allow air to flow through the pipes. This device allows air to flow through the pipes opposite to the direction of flow outside the pipes. This results in reduced drag and improved store separation characteristics.

Polymer Composite Preform and Process for Producing Same
See 0560

0934 Serrated Trailing Edges for Improving Lift and Drag Characteristics of Lifting Surfaces
P. M. H. W. Vijgen, F. G. Howard, D. M. Bushnell, B. J. Holmes
National Aeronautics and Space Administration, Hampton, VA. Langley Research Center
Filed 30 Nov 89 16p
PAT-APPL-7-429 516 Available from NTIS: price code N03
An improvement in the lift and drag characteristics of a lifting surface is achieved by attaching a serrated panel to the trailing edge of the lifting surface. The serrations may have a saw-tooth configuration, with a 60 degree included angle between adjacent serrations. The serrations may vary in shape and size over the span-wise length of the lifting surface, and may be positioned at fixed or adjustable deflections relative to the chord of the lifting surface.

Some 1-(Diorganooxyphosphonyl)Methyl-2,4- and -2,6-Dinitro-Benzenes
See 0097

Ultrasonic Assisted Paint Removal Method
See 0544

0935 Yaw Fin Deployment Apparatus for Ejection Seat
A. T. Tran, C. R. Tung, P. W. Yost
Department of the Navy, Washington, DC
Filed 5 Jul 88, patented 20 Feb 90 7p
PATENT-4 901 951 Available from Comm. of Patents
A yaw fin deployment apparatus provides a continuous deployment force to the fin during the entire range of deployment. A shaft, a movable sleeve bearing for riding along the shaft, a strut connected between the sleeve bearing and the fin, and a lanyard for continuously pulling the sleeve bearing along the shaft are provided. The momentum created when the ejection seat separates from the aircraft is transmitted to the lanyard, to the sleeve bearing, and to the strut for deploying the fin. A pulley is attached to the seat and is located near the aft end of the shaft and guides the lanyard to assure that the actuation force exerted on the sleeve bearing is in a direction parallel to the axis of the shaft. When the fin is fully deployed, the lanyard separates from the sleeve bearing through a split ring at the bottom of the sleeve bearing. A primary spring-loaded latch located at the aft end of the shaft locks the fin in a fully deployed position. PAT-CL-244/122.

TRANSPORTATION: Other

Actuated Forebody Strakes
See 0928

0936 Actuation System for an Encapsulating Life Raft
G. R. Whitman, D. S. McCauley
Department of the Navy, Washington, DC
Filed 24 Jun 88, patented 29 Aug 89 10p
PATENT-4 861 298 Available from Comm. of Patents
An actuation system for a two-section encapsulating life raft system is provided which includes a manually releasable spring-based linkage assembly that normally serves to link a cable from the pressurized source for the encapsulating raft section and a cable for automatically actuating both the main raft section and the encapsulating section. Furthermore, by a simple manual operation, the linkage assembly undergoes rapid disassembly, and the cable for the pressurized source is disconnected from the actuating cable. A spring in the spring-biased assembly is compressed to store energy during connection of the assembly to the pressurized source cable, and the spring is retained in a compressed state as long as the linkage function is maintained. A manually removable retention pin is provided that normally retains the spring in the compressed state to retain the linkage function. However, when the retention pin is manually removed from the linkage retention position, the energy from the compressed spring is released, and the linkage assembly positively disassembles and disconnects the cable from the pressurized gas source from the linkage assembly. By breaking connection between the cable for the pressurized source and the linkage assembly, the cable for the pressurized source is disconnected from the actuation cable, thereby preventing the encapsulating raft section from being inflated. Patents.

0937 Airplane Takeoff and Landing Performance Monitoring System
D. B. Middleton, R. Srivatsan, L. H. Person
National Aeronautics and Space Administration, Hampton, VA. Langley Research Center
Filed 6 Aug 87, patented 27 Jun 89 25p
PATENT-4 843 554 Available from Comm. of Patents
The invention is a real-time takeoff and landing performance monitoring system which provides the pilot with graphic and metric information to assist in decisions related to achieving rotation speed (V sub R) within the safe zone of the runway or stopping the aircraft on the runway after landing or take off abort. The system processes information in two segments: a pretakeoff segment and a real-time segment. One-time inputs of ambient conditions and airplane configuration information are used in the pretakeoff segment to generate scheduled performance data. The real-time segment uses the scheduled performance data, runway length data and transducer measured parameters to monitor the performance of the airplane throughout the takeoff roll. An important feature of this segment is that it updates the estimated runway rolling friction coefficient. Airplane performance predictions also reflect changes in headwind occurring as the takeoff roll progresses. The system displays the position of the airplane on the runway, indicating runway used and runway available, summarizes the critical information into a situation advisory flag, flags engine failures and off-nominal acceleration performance, and indicates where on the runway particular events such as decision speed (V sub 1), rotation speed (V sub R) and expected stop points will occur based on actual or predicted performance. The display also indicates airspeed, wind vector, engine pressure ratios, second segment climb speed, and balanced field length (BFL). The system detects performance deficiencies by comparing the airplane's present performance with a predicted nominal performance based upon the given conditions.

Apparatus for Deploying and Recovering a Seaborne Vessel
See 0513

Articulated Suspension System
See 0444

0938 Efficient Detection and Signal Parameter Estimation with Application to High Dynamic Gps Receiver
R. Kumar
National Aeronautics and Space Administration, Pasadena, CA. Pasadena Office
Filed 31 Oct 89 45p
PAT-APPL-7-429 734 Available from NTIS: price code N03
In a system for deriving position, velocity, and acceleration information from a received signal emitted from an object to be tracked wherein the signal comprises a carrier signal phase modulated by unknown binary data and experiencing very high Doppler and Doppler rate, this invention provides combined estimation/detection apparatus for simultaneously detecting data bits and obtaining estimates of signal parameters such as carrier phase and frequency related to receiver dynamics in a sequential manner. There is a first stage for obtaining estimates of the signal parameters related to phase and frequency in the vicinity of possible data transitions on the basis of measurements obtained within a current data bit. A second stage uses the estimates from the first stage to decide whether or not a data transition has actually occurred. There is a third stage for removing data modulation from the received signal when a data transition has occurred and a fourth stage for using the received signal with data modulation removed therefrom to update global parameters which are dependent only upon receiver dynamics and independent of data modulation. Finally, there is a fifth stage for using the global parameters to determine the position, velocity, and acceleration of the object.

Fast Grid Generation
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0939 Inflatable Fuel Tank Buffer
J. R. Bates
Department of the Navy, Washington, DC
Filed 6 Jun 83, patented 12 Dec 89 5p
PATENT-4 886 225 Available from Comm. of Patents
An inflatable bladder is placed between the wall of an aircraft inlet duct and the liquid fuel to reduce the potential damage caused by hydrodynamic ram effects from a projectile penetrating the fuel tank. The inflatable bladder is inflated by a regulated gas source prior to combat. The inflatable bladder may be formed as a double layered section of a rubber bladder fuel cell type fuel tank, or an inflatable bladder may be bonded to the inner surface of an integral fuel tank wall. Patents.

Passive Venting Technique for Shallow Cavities
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Portable Rapid Installable Dolphin System
See 0524

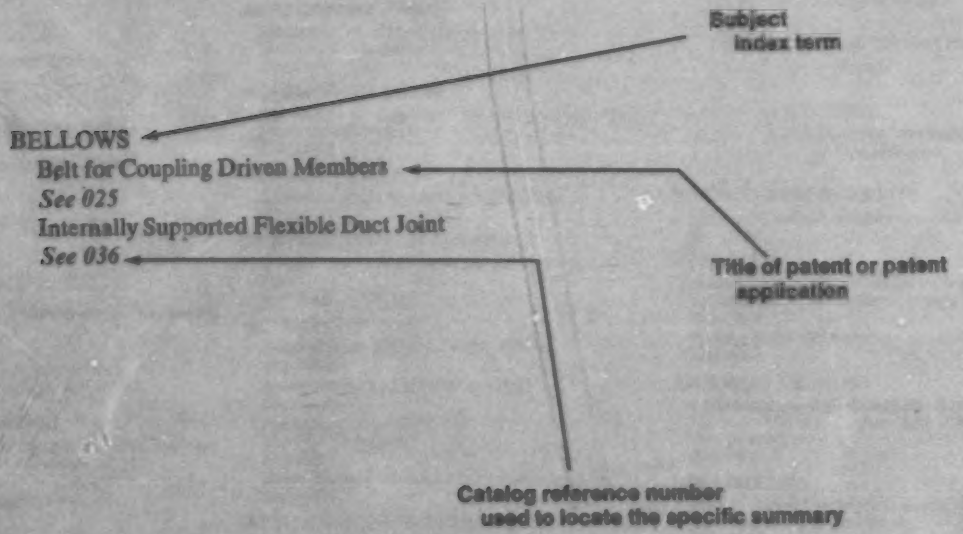
0940 Quantitative Surface Temperature Measurement Using Two-Color Thermographic Phosphors and Video Equipment
G. M. Buck
National Aeronautics and Space Administration, Hampton, VA. Langley Research Center
Filed 13 Jun 88, patented 5 Dec 89 7p
PATENT-4 885 633 Available from Comm. of Patents
A thermal imaging system provides quantitative temperature information and is particularly useful in hypersonic wind tunnel applications. An object to be measured is prepared by coating with a two-color, ultraviolet-activated, thermographic phosphor. The colors emitted by the phosphor are detected by a conventional color video camera. A phosphor emitting blue and green light with a ratio that varies depending on temperature is used so that the intensity of light in the blue and green wavelengths detected by the blue and green tubes in the video camera can be compared. Signals representing the intensity of blue and green light at points on the surface of the model in a hypersonic wind tunnel are used to calculate a ratio of blue to green light intensity which provides quantitative temperature information for the surface of the model.

0941 Semi-Automatic Direction Finding Set
W. P. Huntley, D. J. Swanick
Department of the Navy, Washington, DC
Filed 5 Dec 89 14p
PAT-APPL-7-446 262 Available from NTIS: price code N03
A receiver selects and amplitude demodulates an RF signal from one of a plurality of directional antennas. The demodulated signal is then delayed to put it in time synchronism with the same signal information from an omnidirectional antenna. A signal is then generated of the peak pulses of the demodulated signal when the pulses are in time synchronism with pulses from the omnidirectional antenna. A control indicator receives the peak pulses along with periscope bearing signals and ship's heading signals and gives an r, theta display of the amplitude of the RF signal selected from the directional antenna at the periscope true bearing angle. Patent applications.

SUBJECT INDEX

Index entries are selected to indicate important ideas and concepts presented in a technology summary. When using the subject index, be sure to look under terms that are narrow, broad, or related to a particular topic. The entries are arranged alphabetically by subject term. Individual items listed under subject terms are arranged alphabetically by title.

Subject Index Sample Entry


Subject index term
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Internally Supported Flexible Duct Joint
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Title of patent or patent application
Catalog reference number used to locate the specific summary

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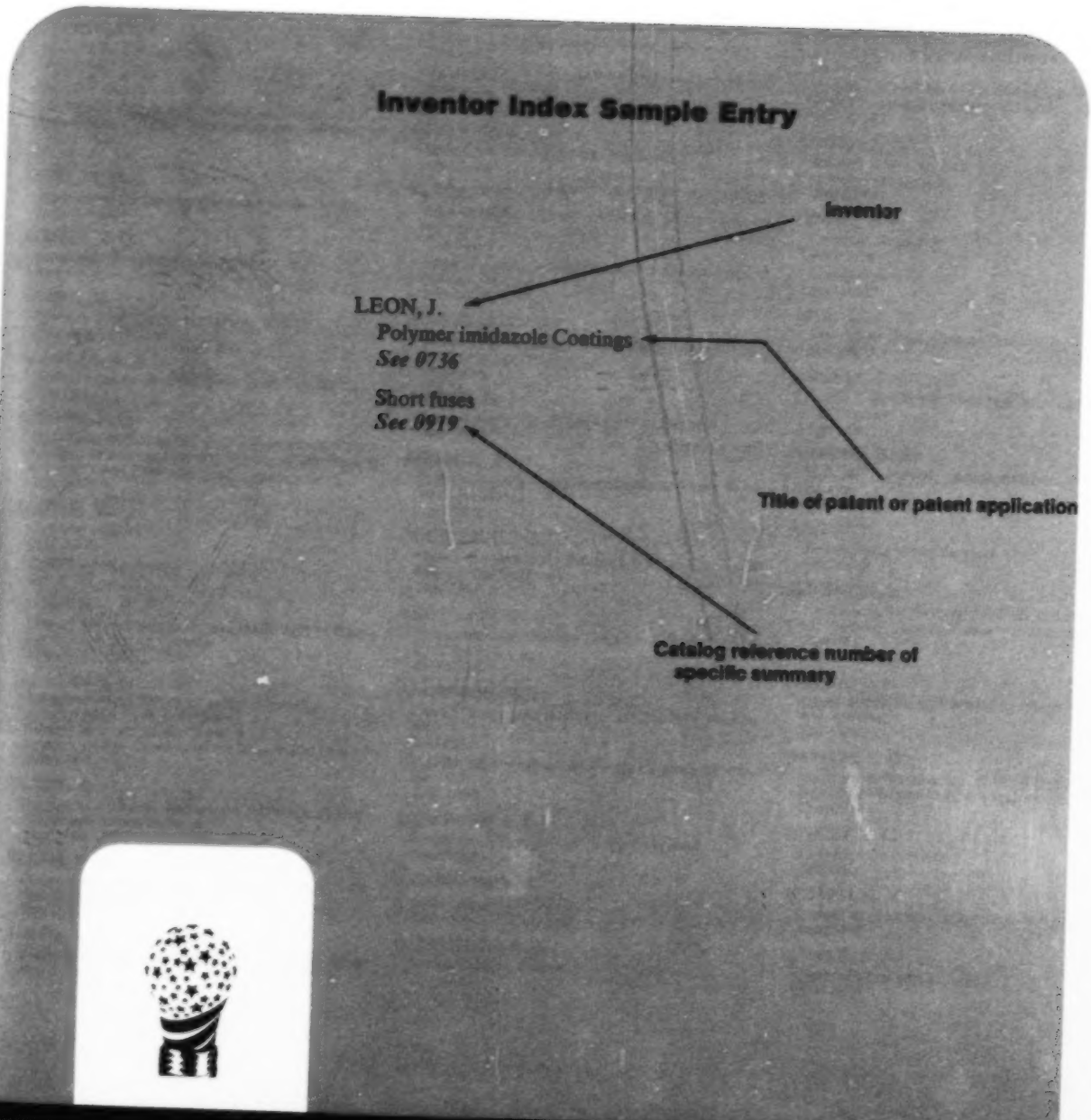

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